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COMPUTERWORLD

Citicorp protects its 'assets'

Consolidation efforts lead to better software license tracking

By Thomas Hoffman
NEW YORK

When Citicorp struck a flat-fee, enterprisewide software agreement with Computer Associates International, Inc. last October, the deal was merely one aspect of a worldwide software asset management program.

Citicorp Vice President Salvatore Giordano III, who spoke here at last week's Information Management Conference — co-sponsored by The Conference Board and Gartner Group, Inc. — detailed some of the $219.3 billion bank holding company's other approaches to improved software asset management. These include reducing the number of vendors it works with, developing a new flat-fee, enterprisewide software agreement with Legent Corp. and negotiating with IBM and other vendors for license changes.

Giordano said the moves are part of Citicorp's ongoing data center consolidation [CW, Nov. 18, 1991]. Although Giordano would not divulge how far Citicorp has come in its worldwide data center consolidation efforts, analysts said they believe the firm has reduced its global data centers from 150 to approximately 50. Analysts placed Citicorp's annual worldwide information systems budget at $1.5 billion.

A model contract

Citibank's latest licensing deal with Legent features a combination of flat-fee, user-based and operating system pricing. Here's how other users rate these choices and other pricing models:

Percent of users who judged model 'most fair'
Base: 1,245 users
(multiple responses permitted)

Based on number of users	34%
Based on CPU type	31%
Usage metering (based on number of transactions)	25%
Based on operating systems	21%
Single-level pricing	20%
Tiered pricing	11%

Source: Xephon — CW Chart: Michael Siggins

Cost not only concern

Software asset management is not just a cost-cutting plan, Giordano explained, but rather an attempt by the bank to protect itself from long-term exposure to software upgrade and transfer fees. However, Giordano, who was wooed away from Coopers & Lybrand by Citicorp 15 months ago, does expect the program to yield substantial short- and long-term cost savings.

"I think we're going to reduce our cost base by a couple of percentage points," he predicted, declining to elaborate.

Citicorp, *page 16*

Travel firm seeks lift from X.25 net

By Joanie M. Wexler
ATLANTA

■ Worldspan Travel Information Services last week made a technology shift that could signal a trend in the ailing travel industry: It began to migrate from a leased-line data communications infrastructure to a more economical and far-reaching switched network.

The company signed a multiyear, $100 million deal with AT&T for an X.25 network that will initially serve its 10,000 U.S. travel agency members. A key reason for moving to the switched scenario is cost: It is less expensive to pay for local access into a switched data highway than to foot the bill for myriad dedicated lines running extremely long distances, explained George Balog, senior vice president of operations and technology.

In addition, the switched network allows dispersed travel agents and others to tap into more distributed hosts and services as the business expands, Balog said.

The move is seen as a trend in the airline and travel industry, kicked off three weeks ago by AMR Corp., American Airlines' parent. Such companies are likely to move to switched networks to leverage today's most competitive segment of the travel business — information and reservation services — to offset long-sagging airline financials, analysts said.

In fact, Worldspan — the world's fourth-largest computerized reservation system — plans eventually to link with

Travel firm, *page 12*

Perot growing pains strain relationships

Staffing issues and delays hurt projects

By Mark Halper
RESTON, VA.

After a fast start from illustrious roots, Perot Systems Corp. has spent much of the last year catching its breath and juggling resources to fulfill an abundance of user promises.

Double pleasure?

Perot Systems is enjoying rapid growth, although observers question whether it can be sustained

Source: Merrill Lynch & Co.; G2 Research, Inc.

A can-do, breakneck pace enabled the firm inspired by billionaire co-founder H. Ross Perot to grow into a $250 million company in five years. Growing pains, however, set in early last year, soon after the firm landed its last two major contracts, sources close to the company said.

One of those jobs, the Europcar International downsizing plum [CW, May 18, 1992], has suffered enough bruises to cause Perot to redeploy star staff members from large clients such as the $118 billion NationsBank, upsetting those customers and in some cases disrupting their service, according to several former Perot employees and current customers who asked not to be identified.

Perot has had to switch software

Perot, *page 14*

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Super(market) IS

Kash n' Karry shops in new technology aisles

By Maryfran Johnson
TAMPA, FLA.

James Stikeleather *heads development*

Kash n' Karry Food Stores, Inc. is parlaying its unique, leading-edge object development technology into a multimillion-dollar bargaining chip as the $1.2 billion grocery store chain enters the final weeks of negotiations with a trio of major systems vendors.

By the end of this month, Kash n' Karry intends to disclose plans to roll out point-of-sale systems and in-store Unix-based processors to its 115 stores starting later this year. Moreover, the supplier of Kash n' Karry's Store 2000 system will be part of an unusual joint marketing agreement based on the grocer's own object-based tool sets (see story page 24).

Initial vendor bids for the Store 2000 contract ranged from $150,000 to $200,000 per store — an $18 million to $23 million bill that Kash n' Karry executives found a bit too steep. Once vendor interest in the company's object technology was piqued, however, Kash n' Karry found itself in a much stronger position for dealmaking.

Company officials declined to name the three vendors involved because only one

Kash n' Karry, *page 24*

Publix Super Markets' Daniel Risener is helping to create an agile, new IS department. Page 61

ASSET MANAGEMENT

Users and vendors are getting serious about software tracking. Citicorp, for example, has embarked on a worldwide software asset management initiative that is designed to reduce long-term exposure to accelerated software budgets because of upgrade fees and relicensing issues tied to its worldwide data center consolidations. *Page 1.* Gradient Technologies is working on separate projects with both DEC and Novell designed to help administrators track software purchasing and manage licensing and use across LANs and enterprise networks, respectively. *Pages 8 and 16*

NETWORKING

Vendors will start rolling out local- to wide-area ATM switches along with messaging products based on the X.400 messaging standard at Interop '93 Spring next week. *Pages 8 and 12.* Meanwhile, a trio of vendors — IBM, Sun and HP — offered an alternative to FDDI technology that they hope will define a standard for fiber-optic workstation connections. *Page 14.* Other access improvements in the works come from Novell, which is putting its IPX-revving software on Wellfleet routers to further ingrain itself in the enterprise networking market. *Page 8.* And BT North America has embarked on a three-year initiative to broaden user choices for accessing its data network faster, more cheaply and more ubiquitously. *Page 12*

HIGH-TECH POLICY

Government officials mixed it up with the technology sector in several venues last week. After meeting with President Bill Clinton and Vice President Albert Gore, industry executives generally praised their plans for high tech but said the proposed spending cuts do not go far enough. *Page 85.* Separately, Clinton's State of the Union address reportedly gives Section 1706 proponents more ammunition with which to repeal the section. *Page 71*

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Managed health care

EDS, Blue Cross eyeing EDI

By Nell Margolis
DALLAS

Electronic Data Systems Corp. and Blue Cross/Blue Shield of Maryland last week inked a pact aimed at positioning the partners as pioneers in the burgeoning managed health care arena.

Under the 10-year contract, EDS will take over management of Maryland Blue's LifeCard division in Owings Mills, Md., putting its largely manual claims processing operation — currently about 30% of the insurer's total volume — on-line via an electronic document interchange (EDI) system.

For Maryland Blue, which holds an estimated 50% share of Maryland's regional health insurance market, upgrading to EDI through EDS means multiplying many times over the 5.8 million claims annually that it currently can handle, said Senior Vice President Thomas Higgins. The upgrade, Higgins said, is slated to be accomplished within a matter of months.

All 28 LifeCard employees will be offered jobs at EDS, he added; the division will remain in Owings Mills. What is more, Higgins said, using EDS' vaunted processing power will enable Maryland Blue to do more for less.

In a report issued last spring, the U.S. Department of Health and Human Services pegged the savings inherent in electronic claims filing at $5 per claim.

Nifty numbers, but the "real significance of the deal," Higgins said, "is that it lays the technological groundwork for a planned private-sector, statewide 'all-player' network" linking health care providers, payers and patients of every ilk. Plans to leverage the Maryland Blue system into the Maryland Health Information Network will go into effect well within the current year, Higgins said. That will rank Maryland among "only a handful of states" with an all-player network up and running, he added.

The Maryland all-player network scenario is the very model of a modern major general health care information exchange and a cornerstone of the managed health care concept that quickly gained currency in the Clinton White House, said Alice Lusk, EDS corporate vice president and group executive.

For EDS, it is also "a critical piece of a broader strategy," Lusk said. The $8.2 billion outsourcing player has an intercompany task force at work targeting ways to "take immediate and effective advantage of any [federal] legislation that is forthcoming," Lusk said.

EDS has forged alliances with Tulsa, Okla.-based reimbursement management services provider CIS Technologies, Inc. and Health Information Technologies, Inc. The latter is a Princeton, N.J., firm that runs an electronic communications network linking doctors and insurers. Both partners will play pivotal roles in the creation of the Maryland all-player network, according to EDS.

A "key piece of our strategy is to make a significant local impact very quickly," Lusk said. Maryland Blue, with its dominant market share, offered an exciting prospect but not an exclusive one: "We're having a lot of discussions with a lot of players," she added.

So did Maryland Blue, Higgins noted: Some 27 services providers queued up to bid for the contract that EDS won on the basis of its fiscal stability and health care depth.

EDI savings

The health care industry's Workgroup for Electronic Data Interchange estimates that multiplayer EDI could top $4 billion to $10 billion from a health care administration bill pegged in a *Consumer Reports* study at a whopping $163 billion. Arthur D. Little, Inc. in Cambridge, Mass., placed the potential savings at $30 billion.

Late Breaking News Briefs

Manhattan blast preempts trading

An explosion under the World Trade Center in New York Friday afternoon knocked out Over The Counter Market computers at downtown brokerages, closing two commodity exchanges, according to a published report. The resulting fire disrupted 149 NASDAQ terminals at various brokerages throughout lower Manhattan. About 86 of the terminals were restored through temporary telephone hookups, while 51 never resumed operation. NASDAQ also halted trading on its Small Order Execution System, which processes trades of 1,000 shares or less.

IBM sends pink slips

IBM's no-layoffs policy officially bit the dust last week when the company announced it will eliminate more than 500 corporate staff and service operations positions in its Armonk, N.Y., headquarters group. A voluntary retirement program will be used, but "layoffs will be required to accomplish the total reduction," IBM said in a statement. Included in the cuts were roughly 150 corporate staff jobs and approximately 350 service operations jobs. Service operations staff members provide billable services to IBM's business units, the company said.

Layoffs temper Novell profits

Novell, Inc. announced both record quarterly profits and a 4%, or 160-person, layoff last week. Novell posted fiscal first-quarter earnings of $70.9 million, a 36% increase over the same period in 1992. Quarterly sales rose 27% to $260 million, with sales of NetWare v3.11 growing 60%.

Microsoft Windows claim overturned

Microsoft Corp. lost a round in its bid to register Windows with the U.S. Patent and Trademark Office. The office made a nonfinal action denying Microsoft the trademark on the grounds that it found Windows to be a generic term. A Microsoft attorney said the firm is planning to present counterarguments in hopes that the trademark office will reverse its decision.

BUSINE

INTERN COMPE INTENSI

One by one, world trac falling, leading to the r truly global marketplace.

Aided by the substan throughs in telecommunic computer technology, many are finding it easier than ever enter markets around the wo were previously unreachable.

Even the smallest firms are to compete on a global basis, and are finding that overseas marke greater growth potential than d markets,which may be flat or satu

However, this advent of inc global competition has had a bruta on price margins.

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werful and are wooing om traditional vironments. NIX, AS/400, 2 offer incredible breakthroughs and (graphical user interfaces).

e hardware platforms are sers await proven, mission- are to run on these exciting ns.

WN-SIZING REND CELERATES

ill be needed is a way to integrate nnovative, new, cost-effective plat- and technology with clients' exist- stems and investments.

one can afford to walk away from past investment and start over. ouring hundreds of millions of dol- IS systems for several decades, America is starting to demand ty from its MIS departments. (Return On Investment) of IS difficult to measure and ssible to project. But still, ngful way to assess it must be found.

ne aspect of it that is easy to and that is the amount of n existing IS systems.

g back and adding up the ment in systems, training, levelopment, etc., it's easy to how much a corporation will ndoning its current systems.

corporations who have under- s exercise, it can be quite a experience. It also puts in a w light proposals to scrap exist- ms. ■

NVESTMENT PROTECTION #1 PRIORITY

many hardware and software ven- e proponents of "starting over" for us self-serving reasons, it is rarely a efficient or rational move for clients. nstead, prudent clients focus on evolu- onary technological advances, as pposed to revolutionary ones. There's o reason to throw away existing sys- tems when there's always technology that integrate the old with the new.

Informix tools to debut

GUI tool sets will target client/server DBMS applications

By Jean S. Bozman
MENLO PARK, CALIF.

Building on the graphical tools embedded in its Wingz spreadsheet, Informix Software, Inc. this week will announce a suite of tools for client/server applications.

Informix-ViewPoint will be marketed as a way to build point-and-click screens for users viewing data stored in Informix-OnLine and Informix-SE relational databases. Companion tools for corporate developers, such as the new Informix-DBA, will allow programmers to fine-tune their client/server database design. That will prevent runaway PC queries that can halt a database engine and will allow users to find data without wading through many database tables.

Oracle and Informix are replacing their character-based tool sets with graphical user interface client/server tools.

The need for client/server capabilities is clear, longtime Informix users said. "Our users rely on standard reports or on ad hoc queries that are done by MIS," said Hal Lindstrom, a systems analyst at the Seattle Municipal Courts in Seattle who said he did not know about the new tools. "But if it's feasible to give them the ability to do their own queries, we could save time and money."

The Seattle court system has a large Informix-OnLine 4.1 database with more than 7G bytes of data — too large for users to peruse from their character-based terminals, he said. Without the means to present selected "views" of the large database, users launch broad-based queries that bring too much data to their desktop terminals.

Informix is making its tool announcements just a few weeks before its largest database competitor, Oracle Corp., is expected to unveil its graphical tool set for client/server applications on March 15. Both vendors are replacing character-based tool sets with graphical user interface client/server tools. Oracle plans to begin shipping its tools between now and June, while Informix expects to deliver its products beginning sometime in the second quarter, with the balance expected later in the year.

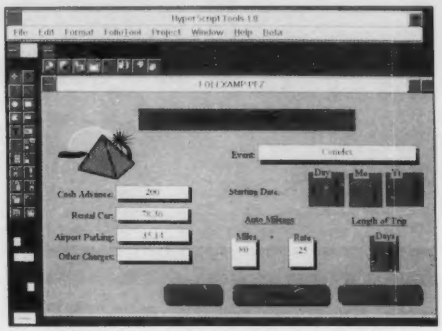
"The database [engine] war is over now that vendors can't differentiate their products much more," explained John Morrell, a software analyst at International Data Corp. in Framingham, Mass. "Now we'll have a tools war."

Into enemy territory

That war could turn hot: Both Informix and Oracle have said they are developing tools to access other vendors' databases. Informix gets 55% of its license revenue from tools sales.

Also debuting this week are Informix-HyperScript Tools, which are based on the object-oriented technology embedded in Wingz. In theory, corporate programmers can create a client/server application once and then deploy it on several platforms; Informix plans to support Microsoft Corp.'s Windows, the Open Software Foundation's OSF/Motif and Apple Computer, Inc.'s Macintosh. A Windows version will be shipped by June, but Informix did not say when the Motif and Macintosh versions would be available.

One beta-test site, Citicorp Mortgage, Inc. in St. Louis, is using several new Informix tools to build a decision-support system for in-house network management. "We're laying the foundation of how you would really enact a distributed network," said Stephen Skinner, a senior applications analyst at the Citicorp banking subsidiary. "Our applications understand what software and hardware are available so we can find the network resources we need."



HyperScript Tools *let programmers deploy a client/server application on several platforms*

Taking off

Informix's Windows-compatible HyperScript software will be available in the second quarter for $2,500; runtime versions will be priced at $400. **Informix-DBA** will be priced at $2,500 for the Windows version; **Windows-compatible ViewPoint** will cost at $795. **Informix-Wingz** 2.0 will be available in the second quarter for $499 per single copy.

Microsoft casts lure for dBase users

By Michael Vizard and Christopher Lindquist
REDMOND, WASH.

Microsoft Corp. last week launched another missive in its campaign to undermine Borland International, Inc.'s installed base of dBase database sites by extending an upgrade program designed to entice dBase users to switch to FoxPro.

Aimed primarily at the retail sales channel, the latest Microsoft program will give dBase users the ability to purchase Version 2.5 of FoxBase for Windows for $149 between now and June 30. The program extends an existing program that allows users of any other PC-based database management system to upgrade to FoxPro for $199.

The Microsoft initiative comes amid reports that Borland's dBase for Windows will not be ready by midyear, as was expected, and will not ship until year's end, a charge that Scotts Valley, Calif.-based Borland refused to confirm or deny. Borland claims it never provided a ship date for the product, though analysts said the company informally promised customers it would be ready by June.

At least one dBase user contacted via CompuServe was disappointed with the news that dBase for Windows was going to be pushed back even further. "Having grown accustomed to numerous Windows 3.1 applications and their WYSIWYG display/print, dropping back to dBase's report writer is genuinely painful," said Matt Nations, a dBase developer.

Nations indicated that his company is still attracted to dBase for several reasons, including familiarity with the environment, the portability of the dBase file and index format and the fact that his company is slated to receive the dBase for Windows compiler free as a dBase IV Version 1.1 customer.

However, new Windows databases are not out of the question as they can read dBase files formats while storing new data in their native formats.

"As matters now stand, we will almost certainly migrate to some other Windows-based relational database before Borland releases dBase for Windows," he said. Microsoft's latest pitch includes a 20-unit license pack offer, a FoxPro evaluation kit and a set of migration utilities.

Borland executives dismissed the latest Microsoft salvo as yet another unsuccessful effort to gain market share.

Borland maintains that in the DOS market, its dBase offering is a stronger product than FoxPro because of its installed base, and the Windows version of FoxPro is only a port of Microsoft's DOS product.

"If you want a state-of-the-art, graphical, event-driven application, you have to program all that stuff in using extensions to the Xbase language that Microsoft has added to FoxPro for Windows," said David Kaplow, director of product marketing at Borland.

Tod Nielsen, Microsoft's group product manager, countered Borland's claims by stating that FoxPro 2.5 for DOS and Windows was hardly a port of the DOS product. He added that users could run their dBase III+ applications under FoxPro "better and faster" than they could under dBase. In addition, Nielsen said FoxPro users could run their old FoxPro code under the new version, something Paradox for Windows users cannot do with their old Paradox applications.

"We don't think it's a bad thing to allow users to run their existing code," Nielsen said.

Nielsen denied that FoxPro users were in any way restricted from using Windows features, noting that FoxPro's screen painter allows developers to create interfaces "visually," while other tools allow access to advanced Windows features such as Object Linking and Embedding.

Timing is crucial

Perhaps the biggest advantage for Microsoft, Nielsen said, is timing. "FoxPro has a Windows product that is at least 12 months ahead of what [Borland is] doing," he said. That should cause some users who need to move applications to Windows to migrate to FoxPro, he said.

Microsoft counters that FoxPro 2.5 is more than 30 times faster than dBase IV 1.5. It said Macmillan Publishing, Inc. and the Bank of Boston have sites that have converted from dBase to FoxPro.

In contrast to the Microsoft approach, Borland is completely rewriting dBase for the Windows environment by customer request, rather than porting dBase IV to Windows.

Open window

The potential growth in the Windows DBMS market will keep vendors vying for a share

Source: Computer Intelligence/Infocorp

dBase add-on

Some dBase users are suggesting using Paradox for Windows graphical tools as a way to access DOS-based dBase data. And if reports from a CompuServe user who claimed to be an insider are true, Borland may be promoting the idea: Its developer's conference may include a session called "Using Paradox for Windows as a dBase Add-On."

REFERENTIAL INTEGRITY COMPARISON

SYBASE

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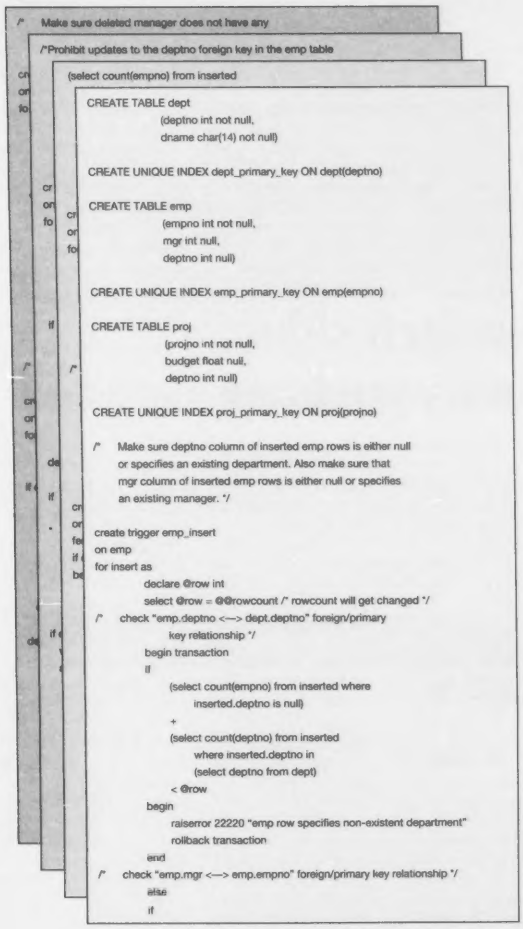

```
/*  Make sure deleted manager does not have any
/*Prohibit updates to the deptno foreign key in the emp table
(select count(empno) from inserted
CREATE TABLE dept
        (deptno int not null,
        dname char(14) not null)

CREATE UNIQUE INDEX dept_primary_key ON dept(deptno)

CREATE TABLE emp
        (empno int not null,
        mgr int null,
        deptno int null)

CREATE UNIQUE INDEX emp_primary_key ON emp(empno)

CREATE TABLE proj
        (projno int not null,
        budget float null,
        deptno int null)

CREATE UNIQUE INDEX proj_primary_key ON proj(projno)

/*  Make sure deptno column of inserted emp rows is either null
    or specifies an existing department. Also make sure that
    mgr column of inserted emp rows is either null or specifies
    an existing manager. */

create trigger emp_insert
on emp
for insert as
    declare @row int
    select @row = @@rowcount /* rowcount will get changed */
/*  check "emp.deptno <--> dept.deptno" foreign/primary
        key relationship */
    begin transaction
    if
        (select count(empno) from inserted where
            inserted.deptno is null)
        +
        (select count(deptno) from inserted
            where inserted.deptno in
            (select deptno from dept)
        < @row
    begin
        raiserror 22220 "emp row specifies non-existent department"
        rollback transaction
    end
/*  check "emp.mgr <--> emp.empno" foreign/primary key relationship */
    else
    if
```

*Program code independently written and tested.

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12 LINES OF INDUSTRY STANDARD SQL

```
CREATE TABLE DEPT
  (DEPTNO NUMBER(2) PRIMARY KEY,
  DNAME CHAR(14) NOT NULL);

CREATE TABLE EMP
  (EMPNO NUMBER(4) PRIMARY KEY,
  MGR NUMBER(4) CONSTRAINT mgr_fkey REFERENCES EMP,
  DEPTNO NUMBER(2) CONSTRAINT dept_fkey REFERENCES
DEPT);

CREATE TABLE PROJ
  (PROJNO NUMBER(4) PRIMARY KEY,
  BUDGET NUMBER(7,2),
  DEPTNO NUMBER(2) CONSTRAINT pdept_fkey REFERENCES
DEPT
    ON DELETE CASCADE);
```

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News Shorts

What's in a name?

On one level, **Ameritech Corp.**'s restructuring last week was a cosmetic name change. Its five "Bell" telephone companies in Illinois, Indiana, Michigan, Wisconsin and Ohio will now be known as "Ameritech" in marketing literature and on customers' phone bills. But Ameritech executives said the changes go far deeper and are in preparation for the day when the $11 billion regional holding company is permitted to break out of its regulated shackles and offer currently prohibited services such as long distance and cable television.

Early next month, Ameritech will deliver its regulatory reform plan to the Federal Communications Commission and various state regulatory commissions and will propose separating transport services from switching services.

In other news, Ameritech issued a bid for gear it can use to construct an Asynchronous Transfer Mode (ATM) network throughout its region. Ameritech said it plans to begin ATM testing at year's end, and commercial services are slated for early 1994.

ParcPlace adds environments

ParcPlace Systems, Inc. has added support for IBM's OS/2 2.0 and SunSoft, Inc.'s Solaris 2.x to its VisualWorks application development environment. The Smalltalk-based environment, which also supports Microsoft Corp.'s Windows 3.1, Apple Computer, Inc.'s Macintosh and a variety of Unix implementations, can be used to create programs that are portable across supported platforms, according to the Sunnnyvale, Calif., company. Available now, the OS/2 and Solaris versions are priced at $2,995 and $4,995, respectively.

Da Vinci, Novell strike deal

Da Vinci Systems Corp., the Raleigh, N.C.-based electronic-mail vendor, and **Novell, Inc.** have announced a strategic development agreement focused on more tightly integrating Da Vinci Email with Novell's upcoming NetWare 4.0 local-area network operating system. Da Vinci will write a version of Email that will use NetWare 4.0's directory services and messaging transport standards. Da Vinci will also rewrite the Da Vinci Assistant, its mail-handling product, as a NetWare Loadable Module, eliminating the need for an external gateway and workstation.

Papows heads Notes group

The ex-presidents' club at **Lotus Development Corp.** gained a new member last week. Jeffrey Papows, former president of Cognos, Inc., signed on as vice president of Lotus' new Notes product division. Papows, who is now the sixth former corporate president at Lotus, will report to June Rokoff and John Landry, who head Lotus' development organization. Other former company presidents now at Lotus are Frank Ingari of Ontos, Inc., Robert Weiler of Interleaf, Inc., Said Mohammadioun of Samna Corp., Ke Branscombe of Inference Corp. and David Connor of Vista Consulting. In addition, Landry, Weiler, Papows and Ingari are alumni of Cullinet Software, Inc.

SCO buys IXI

The Santa Cruz Operation (SCO) in Santa Cruz, Calif., last week announced its acquisition of Cambridge, England-based **IXI Ltd.**, a supplier of desktop windowing software for Unix. The $160 million SCO holds an estimated 70% share of the market for Intel Corp.-based PCs running Unix. IXI's X.desktop interface, based on the Open Software Foundation's Motif, is available on more than a dozen Unix platforms.

News shorts, *page 16*

Michelangelo virus

McAfee antivirus code has bug

By James Daly
SANTA CLARA, CALIF.

Preparing for the March 6 arrival of the Michelangelo virus could be trickier than you think.

Users of a McAfee Associates, Inc. antivirus application designed to ferret out the nefarious Michelangelo virus have discovered that the cure can sometimes be worse than the problem.

A software bug in Version 9.12V100 of McAfee's Clean utility may actually render the hard disk of a user's PC inaccessible, according to both McAfee officials and users who have encountered the problem.

"When a procedure is run to remove the Michelangelo virus on some computer systems, the original master boot record of the hard disk is restored to the wrong location, resulting in a nonaccessible hard drive until repaired," said Aryeh Goretsky, manager of technical support at McAfee. "This problem does not occur consistently, and we are now investigating it."

Michelangelo is a memory-resident infector of disk boot sectors and hard disk partition tables that is scheduled to go off every March 6, the birthday of the Renaissance sculptor, architect and painter. On that date, the virus is supposed to format the hard disks of infected systems by overwriting them with random characters from system memory.

The McAfee bug has some users hopping mad. "The product is worse than the virus itself," said Ray Glath, president of RG Software Systems, Inc. in Scottsdale, Ariz. Glath lost complete access to one hard drive during a McAfee cleanup.

To the rescue

Goretsky said the problem can be corrected in several ways, including grafting a boot sector onto the hard disk from another PC or running a disk repair program.

In the meantime, Goretsky suggested that anyone wishing to remove the Michelangelo virus from a hard disk should use the [GENP] I.D. code with Clean instead. For example, CLEAN C: [GENP] will remove the Michelangelo virus by replacing the infected portion of the master boot record with a clean piece of code from the CLEAN.EXE file.

Bumpy road

The new bug marks the latest bump in an already rocky year for McAfee, which recently went public amid much fanfare. Several weeks ago, a federal judge in Richmond, Va., ordered McAfee to stop distributing its Pro-Scan Version 2.31 and Virucide Version 2.33 applications because they were incorrectly identifying some commercially available software packages as infected with viruses.

The ruling came after software maker Imageline sued McAfee for libel and fraud when the Pro-Scan and Virucide products began coming up with "false positive" readings on Imageline's PicturePak and ValuePak products. Imageline executives said the false readings scared away customers.

Hackers switch sides, offer security package

By James Daly
GLADWYNE, PA.

A pair of computer hackers who cut their teeth breaking into computer systems have changed their ways, saying they have designed a new encryption package that improves data security.

VinCrypt is a $159 application that was developed by some of the nation's top underground systems programmers, said co-developer and distributor Ian Murphy, a security consultant who serves as president of Secure Data Systems, Inc.

The DOS-based package has not been approved by any government agency, nor does Murphy want it to be. He said the government-approved Data Encryption Standard and RSA Data Security, Inc.'s data encryption package are inherently insecure because their basic algorithm has been submitted to the National Security Agency.

"We're not going to pass this source code around because we feel that will compromise the security of the data," Murphy said.

Some experts contend, however, that it is impossible to determine VinCrypt's effectiveness if they are not allowed to examine the algorithm.

"How are we going to know how good this package is if we can't test it?" asked Martin Hellman, a cryptographics expert and mathematics professor at Stanford University in Palo Alto, Calif. "It's critically important that an algorithm be made available so we can test it." Murphy noted that he would submit the algorithm for testing.

Murphy said large companies should not be wary of the fact that VinCrypt is a product of hackers. "Security that is truly state of the art often comes from the computer underground," he claimed.

a la mode

VinCrypt, which can reportedly encrypt a 60K file in six seconds, employs two encryption methods. The primary mode can be used on any type of file and can handle non-ASCII characters. The second mode, called Vinlynx, is used exclusively for text files and ASCII files.

Unfortunately, it is an argument that some users cannot stomach. "It's like letting the hawks guard the hen house," said one microcomputer security manager. "They won't let the government have the algorithm, but maybe there's a back door built in for the hacker community. The risk factor would be too uncomfortable."

Tough sell

Brian Redler, manager of information security at The Equitable in New York, agreed. "As an individual user I might take a look at it, but from a corporatewide standpoint, there's no way I could sell management on a product developed by hackers." He noted, however, that the Apple Computer, Inc. Macintosh was originally developed by two hackers: Steve Jobs and Steve Wozniak.

Others were more curious. "I could see taking a look. There would be no harm in that," said John Murphy, chief of the information and communications management branch of the U.S. Department of Energy in Richland, Wash.

But some users said long-term issues such as service and support would be more of a deciding factor. "I would feel uncomfortable dealing with any new company offering a totally proprietary technology, hacker or not," Redler said. "I want to know that they are going to support the product in six months or a year."

DEC to resell object-oriented 4GL

By Michael Vizard
PHOENIX

Digital Equipment Corp. plans to resell an object-oriented, fourth-generation language (4GL) created by a California start-up that has the potential to significantly advance the development of distributed client/server applications across heterogeneous environments, according to analysts.

Developed by Forte Software, Inc. in Oakland, Calif., the Forte object-oriented application development environment will allow developers to write applications in logical components that can be deployed independently of the physical environment they were intended to run in, Forte President Martin Sprinzen said.

As a result, any process can be partitioned to run on a peer-to-peer basis in any client or server system based on the requirements of the applications, Sprinzen said. And because the application is developed using an object-oriented language independent of the environment, developers can dynamically reconfigure their applications as the physical environment changes, Sprinzen added

DEC officials refused to comment on the matter.

In addition to the planned deal with DEC, Forte has sales referral agreements with Sequent Computer Systems, Inc. and Apple Computer, Inc., Sprinzen said.

Sprinzen told attendees at the PC Forum here that Forte will go into beta testing this summer on DEC's VMS, the Open Software Foundation's OSF/1 and Microsoft Corp.'s Windows NT servers, with production release of the software scheduled for the end of this year. Forte also supports Windows clients. The entry-level price for Forte will be $75,000.

"It's too early to say if the Forte software works, but they are definitely saying all the right things for developing the next generation of mission-critical client/server applications," said Aaron Zornes, an industry analyst at Meta Group, Inc.

Forte hopes the ability of its 4GL to generate C++ code in a native file format for multiple types of systems will give it a leg up on Cognos, Inc., The ASK Group, Inc.'s Ingres Products Division, Information Builders, Inc. and SmartStar Corp.

Mips boosts NT support

By Maryfran Johnson
MOUNTAIN VIEW, CALIF.

With Acer America Corp. signing on as its first customer and Microsoft Corp. giving its blessing, Mips Technologies, Inc. will announce today a special research and development facility to help PC makers build RISC boxes based on Mips' processor technology and capable of running Microsoft's Windows NT.

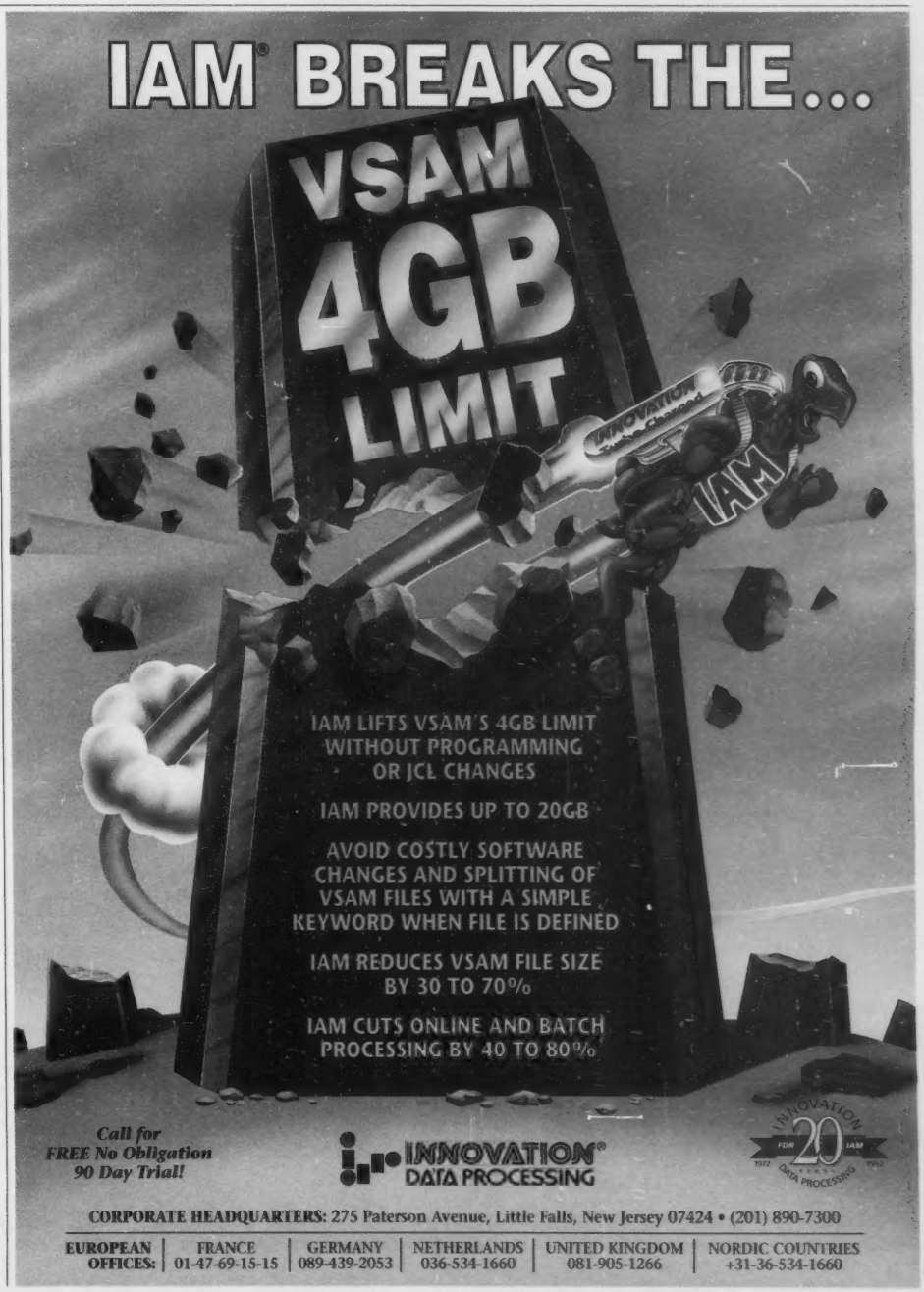
Mips' Open Design Center will provide PC systems designers with prepackaged design kits to integrate Mips' reduced instruction set computing (RISC) processors into their products.

Performance boost

The kits were intended to accelerate product time to market and reduce the costs of developing next-generation PC systems to run Windows NT. Priced from $2,500 to $5,000, the design kits use either the Mips R4000 or R4400 RISC processors, which reportedly deliver roughly twice the price/performance of Intel Corp.'s 66-MHz 1486 and as-yet-undelivered Pentium chips.

Priced under $5,000, the RISC Workstation/EISA design kit includes integrated graphics, networking and multimedia support for the Extended Industry Standard Architecture, or EISA, bus. Other kits will be available later this spring and summer.

The center will also provide support to independent software vendors wishing to port to Windows NT on Mips' RISC platforms. So far, there are only 40 applications committed to NT on Mips.



Vendors switch on ATM links

Cascade, other vendors tighten their LAN-to-WAN connectivity

By Lynda Radosevich
WESTFORD, MASS.

Low-end frame-relay switch vendor Cascade Communications Corp. plans to announce today and demonstrate next week at Interop '93 Spring an Asynchronous Transfer Mode (ATM) switch for connecting local-area networks to wide-area networks.

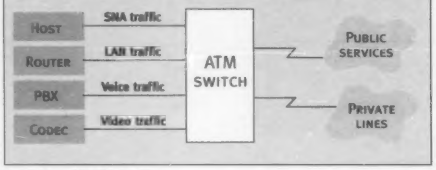
Slated to ship in October, the switch is one of the first ATM local- to wide-area switches to debut, analysts said. StrataCom, Inc. in San Jose, Calif., announced an ATM wide-area switch in January for shipment in the fourth quarter.

Aimed at companies and service providers that want to begin migrating from frame relay to ATM, the switch will let users combine private leased-line and public-packet services and let companies manage data on the public networks, Cascade said.

For example, Internet access provider Performance Systems International, Inc. in Sterling, Va., uses Cascade's frame-relay switches in its internetworking service and plans to deploy the ATM switch when it ships. The switch will give customers speedier and more reliable transmissions without requiring them to install their own ATM equipment, said Marty Schoffstall, vice president and chief technical officer.

Wide-eyed plan

Wide-area ATM switches will reportedly let users mix and match broadband services and manage data across public networks



Source: General DataComm, Inc.

But "ATM has enormous problems from its addressing to standards, and the Cascade switch is an ATM solution for today" rather than a long-term solution, he said.

While analysts said the move to ATM may make sense for companies that have invested in frame relay, they predicted that initial user demand will be for LAN interconnection rather than local- to wide-area connections.

For example, Michael Howard, president of Infonetics Research, Inc. in San Jose, Calif., forecast that large companies' first major applications of ATM will be in 1994 for LAN interconnection, similar to the interconnection role of Fiber Distributed Data Interface today.

Meanwhile, in an attempt to enter the LAN market, modem and multiplexer vendor General DataComm, Inc. in Middlebury, Conn., said it also will announce an ATM local- to wide-area switch today and demonstrate it at Interop. General DataComm said the ATM switch, developed with British company Netcomm Ltd., will ship in August.

Other companies working on ATM wide-area switches include BBN Communications in Cambridge, Mass., and Ascom Timeplex, Inc. in Woodcliff Lake, N.J.

Enterprise networking

Novell IPX gains backbone clout

Teams up with Wellfleet routers

By Joanie M. Wexler
PROVO, UTAH

Novell, Inc. took a key step last week toward honing its network software for enterprise-wide communications when it tapped Wellfleet Communications, Inc. routers as the first to support protocols that accelerate NetWare performance over wide-area links.

The result is interoperability that will blend Novell's low-end, server-based internetworking software with the high-end Wellfleet routers that many firms use to build their network infrastructures. The efforts signal a partnership in which "Novell provides departmental services and Wellfleet is the backbone supplier," said Kanwal Rekhi, executive vice president of Novell's interoperability systems group.

While Novell would not discuss any other such partnerships, the firm said the Wellfleet deal is not exclusive.

The firms will team up to put two pieces of Novell software on Wellfleet routers by the third quarter to let Novell's IPX protocol use wide-area bandwidth more efficiently, said Paul Severino, Wellfleet's president.

Across the board, "router interoperability is still a pipe dream," said Janet Hyland, a Forrester Research, Inc. analyst. She said there are other functions and router vendors in the interoperability equation to consider: "What if Novell and Wellfleet team on SNA encapsulation, but Cisco does it differently? I doubt they'll interoperate."

Similarly, sources close to Wellfleet said Novell is supplying NLSP and IPXWAN source code to the firm — but does not intend to do the same for other router vendors.

Wellfleet estimated that upward of 80% of its customer base includes IPX in their networks.

Comparable to any other

The upshot is that Novell/Wellfleet shops can start expecting the same backbone performance with Novell's IPX that they get with other backbone protocols, analysts said. This means IPX could become a contender in the backbone wars raging among Transmission Control Protocol/Internet Protocol (TCP/IP), Systems Network Architecture, Advanced Peer-to-Peer Networking and Open Systems Interconnect.

"IPX to date lacks the standardization and support that IP and other protocols have," said the corporate internetwork manager of a New York brokerage firm running both Wellfleet routers and NetWare. Novell software on Wellfleet routers "will allow us to gain the same capabilities that OSPF" — a routing protocol — "offers in the IP environment," he said.

Wellfleet routers will support Novell's NetWare Link Services Protocol (NLSP) and IPXWAN protocol. NLSP is the "smart" routing protocol for Novell IPX backbones — the counterpart to Open Shortest Path First (OSPF) in the TCP/IP world.

IPXWAN is a set of IPX tweaks Novell has introduced to make its IPX protocol faster across telecommunications lines. These enhancements have included honing IPX so that it requires less frequent acknowledgments and can send larger chunks of data simultaneously.

Wellfleet/Novell shop Northern States Power Co. in Minneapolis is looking for a revved-up IPX because "we're always adding more [NetWare] servers, most of which are at remote locations," said Steve Magnuson, senior communications engineer.

This situation is increasing the need for more efficient IPX bandwidth use in the wide area, he explained.

"The sooner these protocols are on the Wellfleet box, the better," Magnuson said.

Network administration

Novell, Gradient ease license management

By Michele Dostert
PROVO, UTAH

■ Network administrators struggling to track application licenses and use on large NetWare networks will soon get help from software jointly developed by Novell, Inc. and Gradient Technologies in Hudson, Mass.

Called Electronic Software Licensing (ELS) for NetWare, the software will use Gradient's NetLS license server technology to build a NetWare Loadable Module (NLM) that will run on Novell servers. In addition, Novell and Gradient will deliver developer tools that will facilitate the building of license-enabled NetWare applications. For example, developers would be able to build in mechanisms for tracking which and how many users are using applications.

"Users are demanding a simple way to ensure that they are legal in their application licensing," said Jan Newman, vice president of Novell's NetWare Systems Group. He said the upcoming licensing product, as well as Novell's forthcoming Navigator software distribution product, will greatly reduce the time administrators spend managing application software.

The Network Navigator provides configuration and inventory reports, as well as simplified, automatic, scheduled distribution of software and upgrades.

At least one user agreed. "At last! We've desperately needed a product like this for years," said Craig Anderson, information systems manager at Lutheran Brotherhood insurance company in Minneapolis. "When I took over here, I found that we had no inventory of applications or licensing. I have one person working full-time now just on application and license inventory. Any server-based tools that will help us do that we'll jump on. In fact, Novell is pretty late getting around to it," he said.

"Managing applications takes up a fair amount of our time now; depending on price, we would be very interested in a product that could eliminate that burden," agreed Richard Alexander, system operations officer at the Bank of Kuwait in New York.

The Novell/Gradient product works as follows. If a company has a "concurrent use" license, the product can create a waiting list, allowing users to launch the software when a license becomes available. Other uses include node-locked licensing, in which applications can only be accessed from certain desktops; personal licensing; and time-specific licensing. A Secure Multitiered utility lets administrators dispense licenses from an "inventory" in a secure and accountable manner.

"Besides licensing information, ELS will provide currently unavailable information on actual usage of applications," Newman said. "Administrators may discover that they are paying for 100 licenses, but only 10 users access the application." Newman added that by writing custom-built applications to the ELS application programming interfaces, use of internally developed applications can also be tracked.

The ELS NLM is slated to be available from Novell by year's end, with Software Development Kits for application developers slated to ship in the third quarter of 1993. Pricing has not been set.

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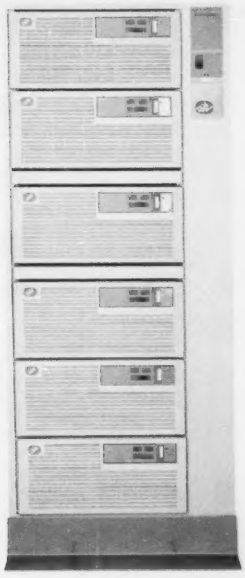

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Oil firm powers up Fujitsu super CPU

Schlumberger subsidiary becomes first U.S. group to move over to VPX 220 vector architecture

By Jean S. Bozman
HOUSTON

A petroleum industry service bureau has become the first U.S. user of a Fujitsu Ltd. VPX 220 vector supercomputer, Fujitsu America, Inc. said last week.

Geco-Prakla, a division of Schlumberger Ltd.'s Oilfield Services Group, is leasing the Japanese machine for five years at a cost of $6 million for hardware, software and services. The firm, which will use the VPX 220 for seismic exploration data analysis, is a service bureau for major U.S. and international oil companies.

The San Jose, Calif.-based American Fujitsu subsidiary won the bid against competitors Cray Research, Inc., Convex Computer Corp. and IBM, said Tom Miller, sales vice president at Fujitsu America's supercomputer group. The VPX 220 series list prices range from $2 million to $18 million.

Industry analysts said they believe there are only a few Japanese supercomputers in the U.S., including one NEC Corp. supercomputer at another Houston oil industry consortium.

Jeffry Canin, a technology analyst at Salomon Brothers, Inc. in San Francisco, said the lease is also a vote of confidence for traditional supercomputers at a time when many users are considering alternative architectures, such as massively parallel processors (MPP).

"In the 1980s, the Japanese were perceived to be a threat to Cray," Canin said. "Now the question is how the vendors will fill the hole left by decreasing defense sales and by the challenge of MPP machines and networked workstations."

Industry analysts said they believe there are only a few Japanese supercomputers in the U.S.

The 1.25 billion floating-point operations per second VPX 220 supercomputer will add 50% more capacity to the Houston site, said Colin Hulme, a Geco-Prakla marketing manager who helped acquire the machine.

The data center here is replacing two older Fujitsu VP 100 supercomputers and one VP 200 machine, which were sold by Amdahl Corp., in which Fujitsu is the largest shareholder, Fujitsu America said. The new computer will run UXP/M, Fujitsu's version of Unix System V Release 4, Hulme said. He said he is not concerned about being the first U.S. user of the VPX 220; Fujitsu said another one is installed in Alberta, Canada. "We had experience with the older Fujitsu machines, and we also have a Fujitsu VP 2000 in Europe," Hulme said.

The fact that the computer was manufactured in Japan was not a factor in the leasing decision, Hulme said, because his own company is transnational.

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BT offers more data access options

By Joanie M. Wexler
SAN JOSE, CALIF.

Reflecting fundamental changes occurring in the way people work and the nature of their computer applications, BT North America, Inc. last week outlined a plan to give its 2 million customers a wider array of choices for accessing its data network.

The initiative, due to begin this year, includes higher access speeds, cheaper local calls that the carrier said could cut on-line network use costs by 30% and wireless links into the network.

In addition, BT has added countrywide uniform 950 calling — the local counterpart to long-distance 800 service — so users will not have to look up a separate 950 access number each time they go to a new location.

The reason for these moves is the growing mobility of users and the response-time-sensitive nature of their applications, explained Jefferey D. Zanardi, manager of network product management at BT.

For example, "the BT network is our only distribution channel, and the sales and service applications we are developing are dependent on higher data-transfer speeds," said Tony Lucente, manager of dealer services at Nissan Motor Corp. U.S.A. in Carson, Calif.

"Most of our access speeds today are below 9.6K bit/sec., so we've been evaluating high-speed alternatives, such as frame relay and satellite" from alternative vendors, he said.

Specifically, BT — which analysts said is catching up to its competitors with some efforts and leaving them in the dust with others (see chart) — plans to offer the following capabilities during the next two to three years:

- An eventual mix of 14.4K bit/sec. and below local dial services in all 520 BT central offices. The effort is scheduled to begin in September.
- Switched 56K bit/sec. access due in July.
- Radio-based wireless access through the RAM Mobile Data radio network in December; users will get one combined RAM/BT bill.
- Wireless cellular connections via CelluPlan II and Cellular Data, Inc. when those services are available. Cellular Data is targeting availability for the second quarter of this year. Service from CelluPlan II, a consortium of McCaw Cellular Communications, Inc., the regional Bell holding companies and IBM, is currently on hold because of dissension from the Bells about AT&T's involvement since its equity purchase in McCaw several months ago.
- Switched T1 (1.5M bit/sec.) and fractional T1 access due in first-quarter 1994.
- Deployment of V.fast (28.8K bit/sec.) modem access speeds planned for six months after a standard is final in early 1994.

"Fundamental changes in demographics and the way employees work is forcing [value-added network] service providers to broaden their spectrum of capabilities," said Daniel Briere, president of TeleChoice, Inc., a consultancy in Montclair, N.J.

Because of this, carriers need "universality, total standards support and various transmission options to solve customers problems today," Briere said.

Variable speed

Value-added network service providers offer dial-up or switched local access to their networks at the following speeds and below:

- **Advantis:** 9.6K, 19.2K, 56K.
- **AT&T:** 9.6K.
- **BT:** 9.6K; 14.4K, 28.8K, 56K (announced).
- **Cable & Wireless:** 9.6K.
- **CompuServe:** 9.6K.
- **GE Information Services:** 9.6K.
- **Graphnet:** 9.6K.
- **Harbinger EDI:** 9.6K, 14.4K.
- **Infonet:** 9.6K
- **MCI:** 9.6K.
- **Sprint:** 9.6K; 14.4K (announced).

Interop '93 focuses on X.400 messaging

By Lynda Radosevich
WASHINGTON, D.C.

■ Enterprise Solutions Ltd. will announce and demonstrate next week several work-flow additions to its Enterprise Mail X.400 messaging line. The company will be just one of many messaging vendors making X.400 announcements at Interop '93 Spring.

Included in the Enterprise announcement will be DOS and Microsoft Corp. Windows-based calendaring and scheduling add-ons for Enterprise Mail, a module that adds security encryption and an add-on that integrates Enterprise Mail with public bulletin-board systems. The add-ons will cost between $20 and $50 per user, Enterprise said.

The add-ons are attractive to Enterprise Mail user Wal-Mart Stores, Inc. because "we are looking to complement the X.400 and X.500 direction we have already taken with capabilities other than E-mail," said Al Marney, senior systems engineer at Wal-Mart's information systems division in Bentonville, Ark.

Enterprise Mail uses the 1988 Open Systems Interconnect (OSI) X.400 messaging and X.500 directory standards at the desktop. While "X.400 has definitely reached critical mass already as a backbone protocol, it has not yet reached critical mass at the desktop," said Daniel Blum, principal at Rapport Communication in Takoma Park, Md.

Other announcements at Interop include the following:

- **Alisa Systems, Inc.** in Pasadena, Calif., will announce software that connects its Digital Equipment Corp. VAX-to-Macintosh electronic-mail integration and directory service product to X.400 and Simple Mail Transfer Protocol-based messaging. The company will also announce that its directory service will work with Lotus Development Corp.'s CC:Mail, Microsoft's Mail and Novell, Inc.'s Message Handling Service.
- **Retix** in Santa Clara, Calif., will demonstrate an X.400 directory exchange server and other components of its Open Messaging Solution, announced in January and now in beta testing.
- **The Wollongong Group, Inc.** will demonstrate its Pathway line of X.400 messaging and X.500 directory services that were announced last week [CW, Feb. 22].

Separately, **Uniplex Integration Systems, Inc.** in Irving, Texas, announced last week a native X.400 mail system for Unix that works with Windows, X Window System and character terminals. Called OnGo Office, the system includes E-mail, calendaring and scheduling and directory and management services based on OSI standards. The office suite is scheduled to ship March 31 and will cost $70 per user for 100 users.

Travel firm seeks lift

CONTINUED FROM PAGE 1

other airline, car rental and hotel systems, Balog said. However, while Worldspan's goal to build an integrated hospitality reservation system makes sense, an AMR-led consortium failed at such an endeavor last year [CW, Aug. 3, 1992].

Worldspan's shift to a hybrid, partially outsourced communications highway will consolidate currently separate private leased lines running from the company's Atlanta and Kansas City data centers to the nationwide travel agencies. Balog said he anticipates the move will save 10% per site on communications costs.

> "It takes resources to manage sophisticated networks and data processing systems."
> *Robert Baudy*
> *DMW Group*

The two data centers currently serve separate computer reservation systems inherited when the PARS system, previously owned by Trans World Airlines and Northwest Airlines, merged with Delta Airlines's Datas II system two years ago to form Worldspan. However, the company is also in the process of consolidating the centers, a Worldspan spokesman said.

Local leased-line, specialized subnetworks managed by Worldspan will feed into a switched X.25 service owned and operated by AT&T. Aside from the economics and reach, Worldspan also aims to gain initial capabilities such as automated software distribution, remote troubleshooting and expanded electronic mail, Balog said.

AT&T will convert multiple protocols, such as the airline industry-specific 19.2K bit/sec. Airline Link Control protocol and IBM's Synchronous Data Link Control, into X.25.

X.25 is appealing because it is a well-proven, worldwide standard that allows connected nodes to tap into many other information resources running the protocol, such as public database services, said Robert Braudy, a principal at consultancy DMW Group, Inc. in Stamford, Conn.

With its decision to outsource the operation of the switched portion of its new network, Worldspan's plan diverges from AMR's. However, AMR has the resources to run its own X.25 network, called AMRnet, while "Worldspan's financials are not as robust," Braudy said.

While privately held Worldspan would not discuss its financials, its three parent companies collectively lost billions of dollars last year; Delta alone posted a half-billion dollar net loss for fiscal 1993, and TWA is currently in Chapter 11.

"It takes resources to manage sophisticated networks and data processing systems," Braudy observed. "You lose a transaction, you lose money."

AMR, for example, will attempt to beef up revenue by selling bandwidth on its network to other companies and acting as an outsourcer to some of those firms, said Braudy, who is a consultant to AMR. Balog said some outside revenue generation from the Worldspan network is also in the plan. "We intend to offer network services to other companies," he said.

Previously, the Worldspan architecture "tied individual terminals to host systems" — Enterprise System/9000-class mainframes in the data centers — and did not accommodate local-area networking, Balog said. Using X.25, "we're any-to-any, and inter-LAN traffic can be supported."

LANs and client/server computing are pervading the travel information business at American's Sabre operations and United Airlines' Covia, which "a year ago ran private lines," said Jeff Bruckner, managing director at DMW.

He said the distributed scheme is economically more sound because "instead of being on-line with the host, you do your stuff on the LAN, then ship the whole thing to the host."

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Rival vendors tout alternative fiber

By Mark Halper
SAN FRANCISCO

A trio of fierce workstation rivals banded together last week in an effort to persuade IS shops to put more fiber into their computing diets.

Conceding that Fiber Distributed Data Interface (FDDI) technology has been less than pleasing to the information systems palate, executives from Hewlett-Packard Co., IBM and Sun Microsystems, Inc. launched the Fibre Channel Systems Initiative to define a standard for fiber-optic workstation connections.

The executives said early use of the technology will be for CPU-to-mass storage — rather than CPU-to-CPU — communications.

A source inside Sun who asked not to be identified said Sun will offer workstations that use a Fibre Channel interface by year's end. HP said it plans to offer product by the end of this year or early next year and that it will announce an availability date in the first half of this year. IBM demonstrated a product in November and said it typically delivers products 12 to 18 months after showing them.

Quick and easy

Fiber channel backers said fiber channel offers several advantages over FDDI. It will perform 10 times faster than FDDI, in part because of its point-to-point deployment. By comparison, FDDI and other networking technologies work on a "party line" basis in which bandwidth is shared, the backers said. The point-to-point deployment requires simpler communications protocols than do shared bandwidth networks, further reducing drag on the communications pathway.

Point-to-point reliance

Channel technologies such as Fibre Channel, copper-based High Performance Parallel Interface (Hippi) and others rely on point-to-point connections for their lightning-fast speeds. This is in contrast to the slower, "party-line" nature of today's shared-medium local-area networks.

Guaranteeing uninterrupted bandwidth between two end points renders channel speeds much faster than FDDI, Ethernet, Token Ring or others.

For example, Fibre Channel speeds are specified at up to 1,000M bit/sec. — about 10 times faster than FDDI's 100M bit/sec. maximum rates. Hippi runs at 800M bit/sec. Such speeds become necessary to prevent the network from becoming a bottleneck when linking high-performance computers that have I/O capabilities exceeding the rate at which a LAN, for example, accepts data.

But fiber channel technology's point-to-point trafficking renders it less suitable for distributed networking, compared with multidirectional or shared-bandwidth technologies, said Dataquest, Inc. analyst Marty Palka. He said tools should emerge to improve Fibre Channel's network capabilities.

Fibre Channel will support single link distances of up to 10 km, Fibre Channel executives said. Early versions of the point-to-point fiber channel technology will support up to 64 connections, noted Phil Hester, vice president of systems and technology at IBM's advanced workstations and systems business. Fibre Channel will evolve to support 256 and then more than 1,000 nodes, he added.

Source: Forrester Research, Inc.

The Fibre Channel group broadens efforts already in place between HP and IBM to share Fibre Channel technology [CW, March 16, 1992]. IBM already uses a slower fiber channel technology, called Escon, in its mainframes.

Executives from IBM's workstation group could not say whether the mainframe group plans to adopt products using Fibre Channel technology. The group said it plans to select specific options from a broader list that the American National Standards Institute X3T9.3 committee is drawing up.

HP, IBM and Sun executives said that by joining forces to hammer out a standard, they hope to avoid the disparity that has hampered FDDI.

"We learned from FDDI that just having a specification and putting it out on the market doesn't necessarily work," noted Wim Roelandts, vice president of HP's computer systems organization.

Advances in Ethernet technology have also hurt FDDI, they said, as "fast Ethernet" is expected to soon approach the 100M bit/sec. speeds characteristic of FDDI.

Fibre Channel executives said FDDI's failure to gain momentum prevented prices for interfaces from falling to affordable levels. "You can buy a PC for less than you pay for an FDDI adapter," noted Andreas Bechtolsheim, Sun Microsystems Computer Corp.'s vice president of technology.

Perot pains

CONTINUED FROM PAGE 1

conversion tools midstream and add support for Europcar affiliates not included in the original business plan, which has caused delivery of system parts to slide by two months, said Robert Verasdonck, Europcar's corporate director of information systems. Europcar is Europe's largest car rental agency.

But Perot President Pat Horner said that while Europcar required Perot to redeploy talent, the move did not harm other customers. "I don't know another company around that isn't changing around resources. We're no different."

Europcar's importance to Perot is clear and not just because a banner performance would showcase its distributed computing capabilities and help Perot shed the image of hierarchical computing that users still attach to outsourcers.

The job carries enormous weight for Europcar's future and could demonstrate that Perot can play an integral role in a company's well-being, if not survival.

"If they don't deliver this year, there may not be a Europcar next year," Verasdonck said. The privately held company is believed to have posted a small profit in 1992 after losing $478 million in 1991.

But if Perot focuses exclusively on Europcar, it risks rankling clients such as NationsBank, for which it handles data processing.

Series of problems

Ex-employees and current Perot customers who asked to remain anonymous said the loss of resources to Europcar was the latest development in a series of troubling events that culminated in a Perot computer crash last December. That crash caused the bank to lose track of account balances for four days [CW, Feb. 8].

Earlier, a Perot project to move data from a mainframe to an NCR Corp. Teradata massively parallel system also flared into discord at NationsBank, sources said.

After the December debacle, NationsBank sent Perot a termination notice, which contractually granted a grace period that Perot Chairman Morton Meyerson has used to return staff members from Europcar and salvage the relationship, the sources said.

A NationsBank spokesman said only that the two companies are not parting ways. Horner declined comment on the NationsBank situation.

Amid the disruptions, Perot has managed to sign what appear to be small contracts with Volkswagen of America, Inc. in Auburn Hills, Mich.; Chrysler Corp.'s Pentastar Services, Inc. rental car operations, which own Snappy Car Rental, Dollar Rent A Car, Inc. and Thrifty Rent-A-Car System, Inc.; and Cadillac Plastic and Chemical Co. in Troy, Mich., a Detroit-based plastics company.

But industry watchers said the NationsBank episode has served as a wake-up call cautioning Perot to get its house in order.

Horner said the schedule at Robert Plan Insurance "was stretched out a little bit" because the insurer experienced significant change during the course of the contract.

ICH, which was one of Perot's earliest customers, is now about half the $12 billion asset company it was when the two parties first agreed on terms, Horner said. Perot has been working hard to help ICH adapt to changes, he added.

Another contract, with scandal-ridden First American Bankshares in Washington, D.C., has had other problems. Sources said the contract has generated marginal revenue at best because the federal government is selling off the bank, which was once secretly controlled by Bank of Credit and Commerce International (BCCI). Perot is retaining only some processing assignments from buyers.

Horner acknowledged that First American had not generated the amount of revenue that Perot had hoped for. The BCCI issue aside, Perot knew it was taking chances on a troubled financial institution.

On the prowl for talent

The departure last fall of former Frito-Lay, Inc. Chief Information Officer Charles Feld may have temporarily stung Perot Systems, but it has not prevented the company from attracting other high-profile talent.

Recent Perot executive appointments include the following:

- Gordon Stevenson, former head of the now-defunct Intrico travel industry consortium. He will oversee the company's push into one of outsourcing's most coveted markets: the travel and leisure industry.
- Change management experts Marc Gerstein and Richard Pascale, who are expected to help clients adjust to shifts in technology as well as to changes within their own corporate fabric, such as company shrinkage and business refocusing.

Likewise, the company has formed an advisory board consisting of Gerstein and Pascale, industry analyst Esther Dyson, Dataquest, Inc. President Judith Hamilton, MIT information technology professor Thomas Malone and investor Steven Brooks.

Perot has also added board members from outside Perot circles, including GTE Corp. Vice Chairman John Segall; former Defense Advanced Research Projects Agency Chief Craig Fields, who now heads Microelectronics and Computer Technology Corp. in Austin, Texas; and Ray Golden, a partner in New York investment firm James D. Wolfensohn, Inc.

Feld left Perot last September, less than two months after he was hired to win an outsourcing deal with troubled transportation force Burlington Northern, Inc. After leaving Perot, Feld landed his own consulting contract to oversee a technology overhaul at Burlington Northern [CW, Sept. 28].

—Mark Halper

NCR developing video-based ATMs

By Thomas Hoffman
NEW YORK

NCR Corp. is developing automated teller machines (ATM) equipped with two-way audio/video capabilities designed to allow bank customers at remote terminals to videoconference with bank employees.

While industry analysts applaud the systems for their technical merit and user-friendliness, reaction is decidedly mixed on how the interactive ATMs will be received by bank information systems executives and external customers.

"I think there will be some applications for these machines, particularly specialized services [such as discount brokerage services]," said James Moore, president of Mentis Corp., an Eden, Md., market research firm that specializes in banking technology.

Two-way, audio/video-equipped ATMs will let bank customers at remote terminals videoconference with bank employees.

The video-equipped ATMs may eventually help encourage consumers to use ATMs for more than only cash transactions, said Diogo Teixeira, a partner at Ernst & Young in Boston.

The next-generation ATMs and self-service terminals within branches would provide customers with expanded services such as mortgage loan information. Customers using the ATMs solely for cash withdrawals would not videoconference with bank employees unless requested using a Touch-Tone keypad.

Huntington Banks in Columbus, Ohio, has expressed a strong interest in the technology. The bank is currently piloting videoconferencing on NCR self-service terminals at its branches, and executives there see a future for their use.

"It's not always possible to have the right bank expert at the location and at the time a customer needs them. Videoconferencing can bridge the distance and bring the banker and customer together, at the customer's convenience," said Bill Randle, director of marketing and strategic planning at Huntington Bancshares, Inc., the parent company of Huntington Banks.

However, Moore voiced concern that the engines used to run interactive video in ATMs — not to mention communications costs and bandwidth problems associated with them — are more expensive than typical ATMs, which are priced at about $15,000 per unit.

An NCR executive who requested anonymity said the vendor is working on alleviating those concerns. At present, he said, the cost of the systems is $5,000 to $6,000 more than standard ATMs, but NCR is hoping to reduce that differential to $1,000 by year's end, when the company plans to begin shipping the new ATMs.

That effort will be aided by new compression/decompression technology being developed by NCR, AT&T and Bell Laboratories. In addition, a new AT&T-based computer chip called Codec will enable ATMs and self-service stations to transmit audio and video.

Phillip Johnston, a senior marketing consultant at NCR, said the proliferation of Integrated Services Digital Networks and fiber-optic networks throughout the U.S. will eventually enable banks to exploit the use of these ATMs by developing "centers of expertise." Johnston said banks would be able to deploy product services experts at central locations to interact with customers using the ATMs at different sites.

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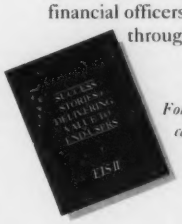

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News Shorts

New Clipper sets sail

Computer Associates International, Inc. has begun shipping CA-Clipper 5.2, an upgrade to its Xbase application development system. The new version features general performance improvements and new links with other Xbase products. Discounts are also available for users of other Xbase systems such as **Microsoft Corp.**'s FoxPro and **Borland International, Inc.**'s dBase. A new version of CA-Clipper Tools, featuring a new **Novell, Inc.** CA-Clipper 5.2, costs $795, and the new CA-Clipper Tools costs $695, although promotional prices are available.

IDAPI completes draft

The vendor consortium that is championing the Integrated Database Application Programming Interface (IDAPI) for client/server connectivity said it has completed a working draft of the specification. The draft was delivered in Austin, Texas, last week to the more than 30 software vendors that have signed up to support IDAPI. IDAPI founder **Borland** plans to deliver a preliminary developer's kit to IDAPI consortium members this summer.

Notebooks to get cellular modem

What its vendors said is the first Personal Computer Memory Card International Association-compliant cellular modem emerged last week for notebook computer/cellular phone users from **AT&T Paradyne** and **Nokia Mobile Phones**. A $699 package with a software interface for Nokia phones and AT&T Paradyne's credit-card-size modem is slated to go on the market in May.

Next-day PCs

PC Connection, Inc. in Marlow, N.H., is about to take the PC mail-order business to its next level of abstraction. The company has started an overnight delivery service for custom-configured PCs, including both peripheral and application software installation. The company said orders received by 10 p.m. will be delivered by noon the next day.

SHORT TAKES **NCR Corp.** in Dayton, Ohio, has created two new units, the Professional Services Division and the Systems Support Division, to expand and consolidate the various consulting and systems integration services within its U.S. group.... In related news, **NCR** expanded its StarSentry network and systems management package to include centralized management of Unix-based systems from **Hewlett-Packard Co., IBM** and **Unisys Corp.** StarSentry already manages NCR, **AT&T** and **Sun Microsystems, Inc.** systems.... **NCR Microelectronics Products Division** in Colorado Springs announced last week an $81 million expansion that will more than double its production capacity at its Colorado Springs semiconductor plant by the third quarter of 1994.... **Intersolv, Inc.** announced a new version of its PVCS configuration management software, PVCS 5.1, featuring a new graphical user interface, project management to standardize development efforts and logical mapping file directories.... **Digital Equipment Corp.** said it will close its hardware manufacturing facility in Galway, Ireland, sometime in the next year, eliminating 780 jobs, although the company's European software development and distribution headquarters will remain in Galway.... Willard H. Scherrer Jr., senior vice president of purchasing at **Consolidated Freightways, Inc.**, has been named senior vice president for transportation systems at **Emery Worldwide**, the Palo Alto, Calif., air freight unit of Consolidated.... **Unisys** declared a dividend of $1.40 per share on Unisys Series A cumulative preferred stock.

Software assets

DEC to help users track licenses

By Melinda-Carol Ballou
MAYNARD, MASS.

Digital Equipment Corp. is expected this week to announce a plan to work with other vendors of software access control technology to ease software management across multivendor systems, according to DEC officials.

Managing software licenses and assets across the enterprise is an enormous headache for users, particularly at large sites (see story page 1).

"It's a problem on any platform — on PCs, on servers, on hosts — so it would be nice to have a single solution," said Stanley Rose, vice president of technical architecture at Bankers Trust Co. in New York.

"The issue for virtually every major corporation in the U.S. and globally is to know what you have, what version [and] be able to [access], track and report on it by product and by vendor, and that is a tall order," said Gene Friedman, vice president of applied technology at Chase Manhattan Bank NA.

DEC is working with other vendors, including Gradient Technologies, Inc. in Hudson, Mass., and Highland Software, to develop products that will let users capture license information in disparate databases and enable managers to manage software across the enterprise, according to Mary Welch, DEC marketing manager for corporate business practices.

Gradient and Highland will seek to extend a License Service Application Programming Interface, established last year by a group of 21 vendors.

> DEC has been ahead of the curve in adopting new software licensing alternatives.

A joint proposal from Hewlett-Packard Co. and Gradient, which included Gradient's NetLS, was chosen last year by the Open Software Foundation (OSF) as the software licensing portion for the Distributed Management Environment (DME). NetLS is becoming a de facto standard, analysts said. Vendors who have adopted NetLS include HP, The Santa Cruz Operation and Novell, Inc. (see story page 8).

DEC is expected to release its own software access control product, code-named Omni, probably by summer, according to DEC sources. It will be compatible with the OSF's DME scheme.

But the market focus, according to DEC, has so far been primarily on developers, enabling them to protect their intellectual property rights and offer more flexible licensing options.

Users need their tools to have consistent access to the products they purchase.

DEC's Omni license management technology will provide a license management call in the applications, a license key that contains information about the license and a license manager that manages the information. Developers will be able to use the same key for an application across different platforms. Users will be able to establish parameters for their license database, letting them access the software across local- or wide-area networks.

DEC will also offer a set of applications and reporting tools to be used with the license management software, giving users the ability to understand what they have, where it is and how it is being used for release later this year.

Len Halio, president of Gradient, said his company will also offer end-user applications for software asset management by year end.

Citicorp

CONTINUED FROM PAGE 1

The initiative is expected to help Citicorp reduce by up to 25% the number of redundant mainframe software packages that it uses throughout its operations, according to Giordano.

As a result, he said, the bank expects to reduce its annual mainframe software maintenance fees by 25%.

"What we've found in the Citicorp environment is that we've paid the same bill many times. As we go through this [data center] consolidation, we are being asked to reduce the number of vendors we work with," Giordano said.

While Citicorp has reduced its data center population by two-thirds, that does not necessarily mean it has reduced software use by that amount.

By moving from a large population of older mainframes to newer, more powerful mainframes with single, powerful CPUs, Citicorp might actually be using fewer software packages.

Under the program, Citicorp is identifying every software package that its various locations use. Furthermore, the bank has gathered all its software vendors' contracts to identify where redundant use of software can be eliminated and/or renegotiate vendor contracts wherever cost benefits can be attained.

For example, Giordano said, in one Citicorp location, the bank was able to identify 1,450 software contracts with 275 vendors. Locating and consolidating all of these contracts "was the hardest task to do. It took me six months in one location to gather all this information," he said.

Agreements afoot

Last October, Citicorp and CA announced a flat-fee, enterprisewide software agreement encompassing the bank's worldwide IS operations [CW, Oct. 19].

Last week, Giordano disclosed that effective Jan. 1, Citicorp began a similar flat-fee contract for all the domestic IBM MVS, VSE and VM-based software packages it uses from Legent Corp. Earlier this month, Legent formally introduced a set of flexible licensing options for its customers.

In addition, Citicorp is renegotiating existing licensing agreements with other mainframe software vendors, including IBM, Giordano said. While he declined to name the other vendors or identify the status of these negotiations, Giordano hinted that IBM may finally loosen its grip on the tiered pricing model it established as a de facto industry practice in the early 1980s.

"What we'd like to do with IBM is have them work with us on our pricing model," Giordano said. IBM has publicly stated that it has no corporate plan to break the tiered pricing model.

However, an industry observer close to IBM who requested anonymity said Big Blue has already worked with a few of its largest customers on new enterprisewide licensing schemes. Sources close to IBM said they expect it to introduce a comprehensive alternative licensing program sometime early next year.

Terrence Quinn, managing director at Furman-Selz, Inc., a New York brokerage house, said he believes CA's introduction of alternative pricing options last April has influenced mainframe customers to demand flexible licensing terms.

"When the word gets out, customers will push for these alternative pricing agreements," Quinn said.

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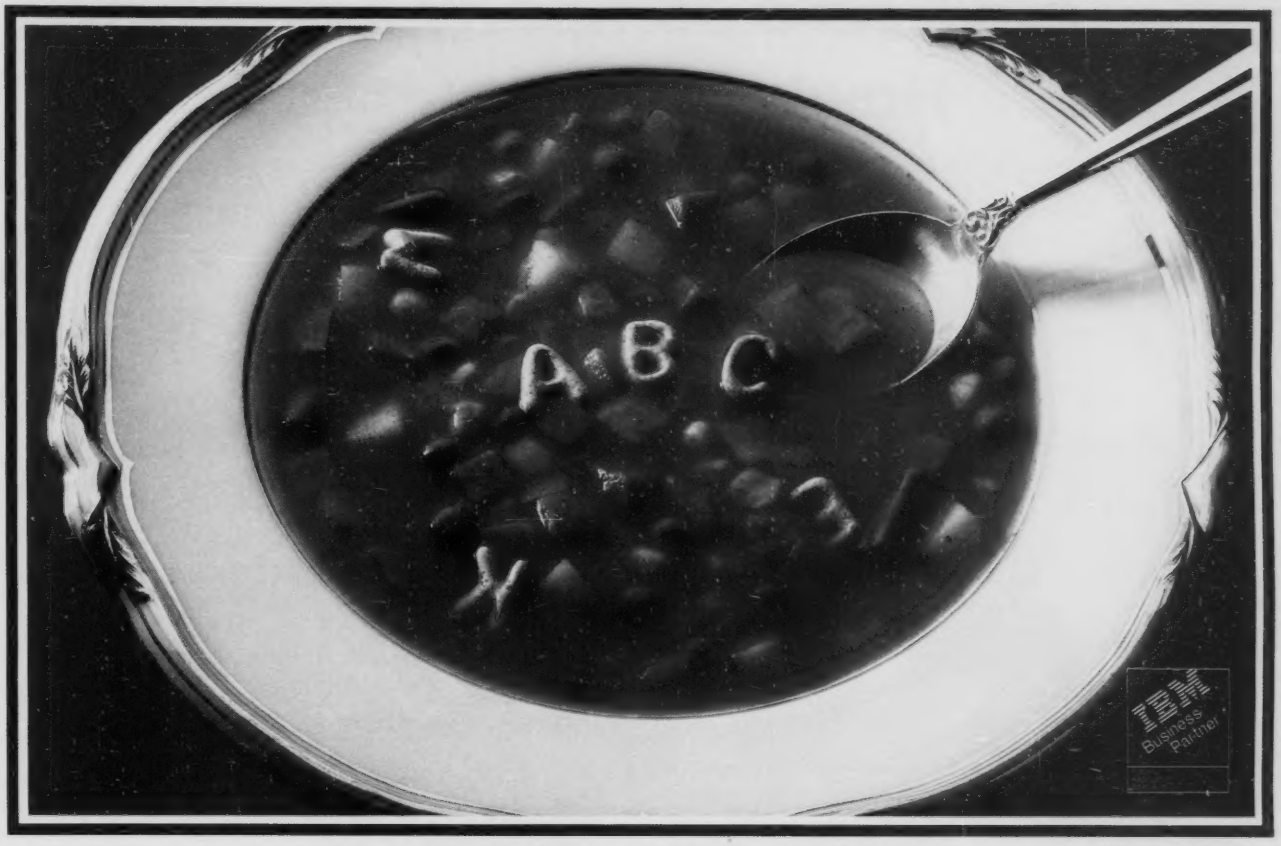

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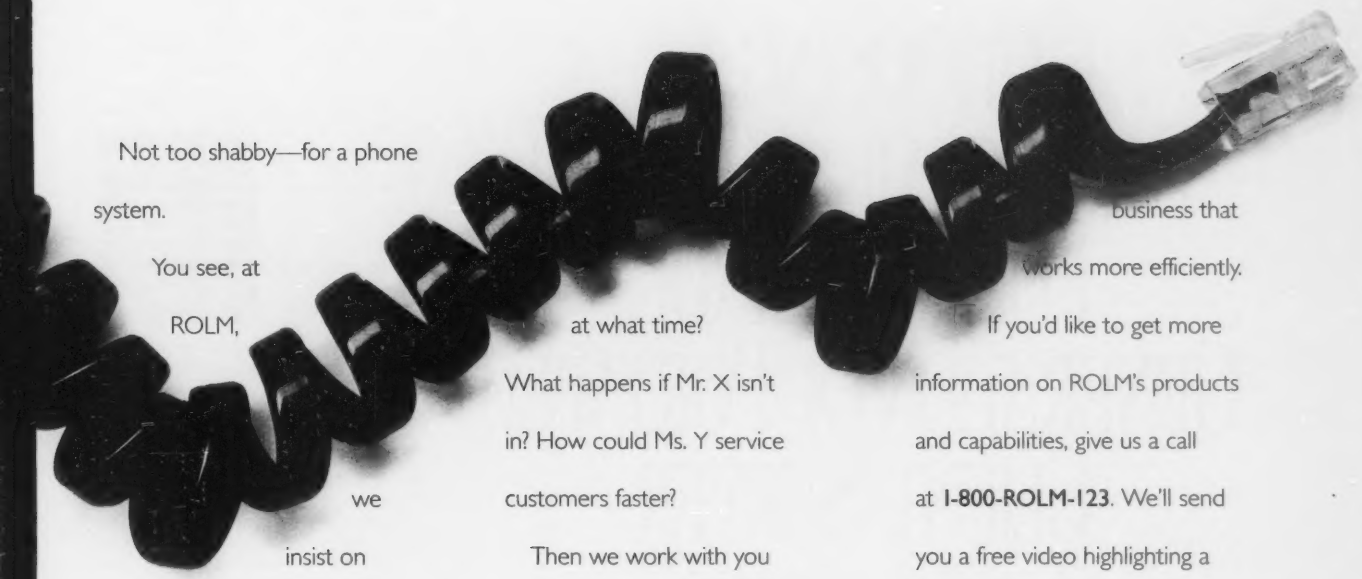

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Dell withdraws $200M stock offering

Decline in share price, soft PC maker market precipitate decision

By Alan Alper
AUSTIN, TEXAS

Dell Computer Corp. last week canceled a long-awaited 4 million-share stock offering, citing unfavorable market conditions.

Late last year, Dell had said it was planning to proceed with the potential $200 million offering, despite the brouhaha following allegations that the PC maker had masked losses on foreign currency trades [CW, Dec. 7, 1992].

A company spokeswoman said an ongoing Securities and Exchange Commission audit of Dell's currency trading had no bearing on the decision to withdraw the offering. The decline in the company's share price — from a high of $50 last December to $36 before the offering was tabled — was a major factor in the decision, she said. The stock tumbled 17%, to $30, after Dell withdrew the offering.

"Since we have cash available, we did not feel we'd have to complete the offering at a lower price," she said, noting that declining interest rates make other financing avenues more attractive at this time and that the company has, if needed, a $200 million credit line.

Dell may need access to additional capital if it is to reach its revenue growth target of 70% in the current fiscal year. If it is met, Dell would be a $3.5 billion company this time next year, financial analysts said.

"Dell has a good balance sheet, so they could go out and get more financing if need be," noted Antoine Tristani, an analyst at Southcoast Capital Corp. in Austin. "If they grow 70%, that would eat up $100 million in cash."

Dell said fiscal fourth-quarter revenue would reach $615 million, while net income would be around $30 million.

Tristani said Dell was wise to pull the stock offering, given concerns over the ongoing PC price wars — which have cut deeply into profit margins — and the recent battering taken by high-technology stocks.

If Dell hits its growth objectives, the stock should rebound accordingly, Tristani pointed out. "They would then have the ability to revisit a common stock offering in six or nine months," he explained.

While a 70% revenue increase appears ambitious, Dell's growth has exceeded that figure every quarter during the last year, the Dell spokeswoman said. And Dell sees no signs of its growth abating.

The company intends to fuel growth through geographic diversification in Asia and Latin America and continued expansion into the home office and consumer segments. Dell also expects to expand its notebook offerings later this year and begin offering "Dellware" services — bundles of preinstalled software and peripherals — in Europe.

Dell's return to its high-flying stock status may take more than revenue growth. "The PC market continues to be difficult and unpredictable, and people aren't interested in paying very high premiums for PC stocks given the current environment," said Eric Zimits, an analyst at Volpe, Welty & Co. in San Francisco.

Product research coordinator Derek Slater contributed to this story.

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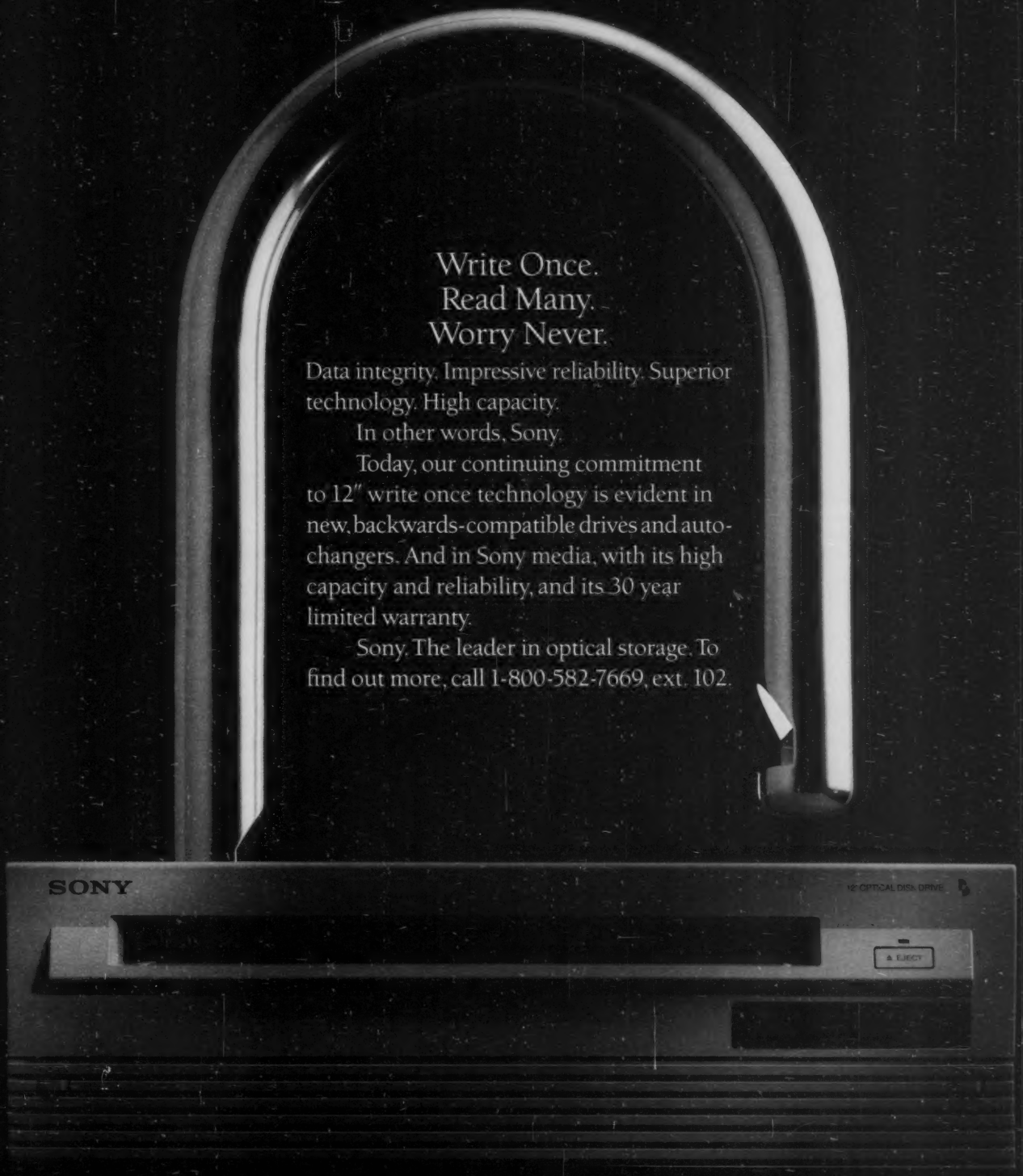

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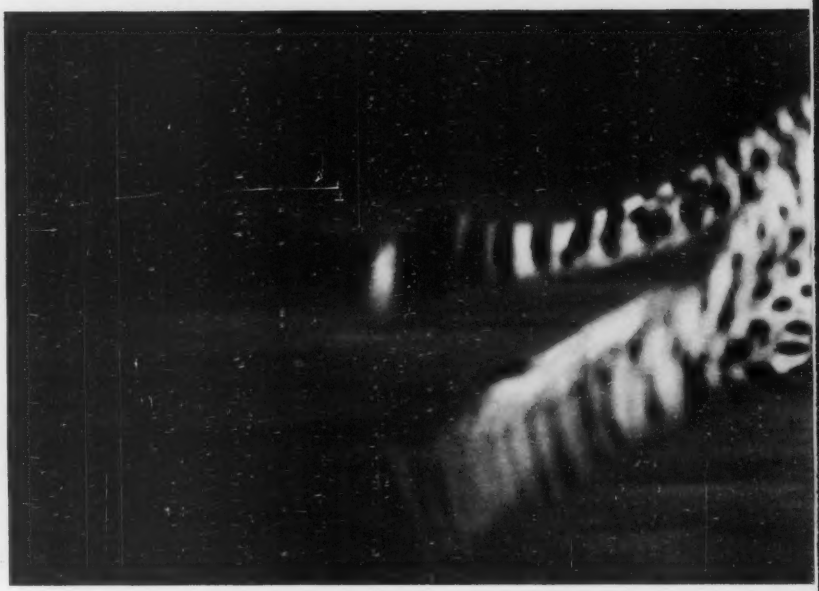

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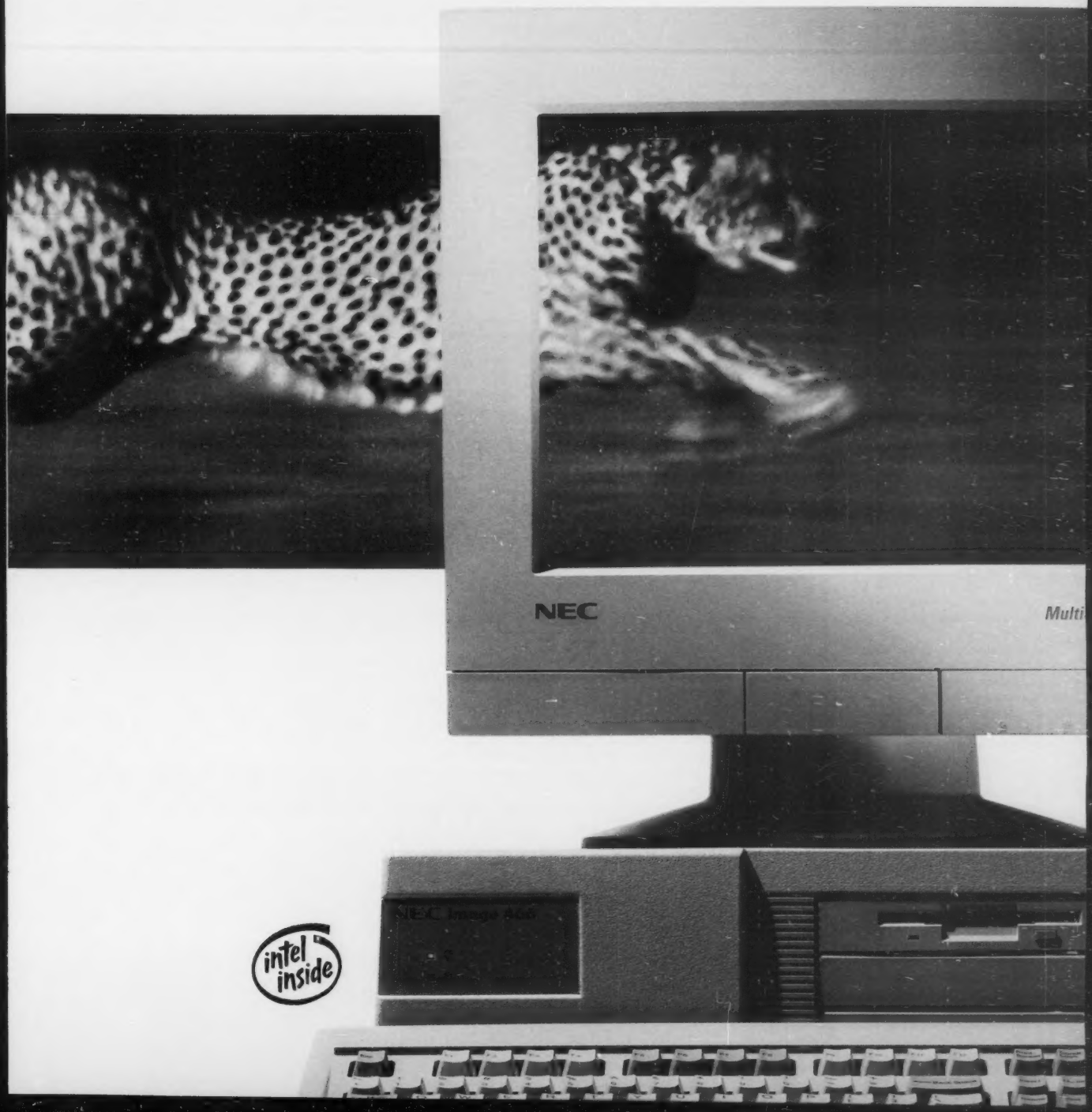

Kash n' Karry shops in new tech

CONTINUED FROM PAGE 1

will emerge the winner. The goal of Store 2000 is to extend Kash n' Karry's new information architecture out to the stores, providing a seamless information flow from the cashier level to the chief executive officer.

"We're more than just your typical grocery store," said Jim Stikeleather, director of systems development at Kash n' Karry. "We got as far as we did [with object technology] because we basically jumped off the bridge and started doing it."

Object of desire

A user survey of 1,000 companies ranked the benefits of object-oriented technology and indicated a threefold gain in productivity

(Listed in order of importance)

1. Improved productivity
2. Flexibility
3. Reuse of software
4. Reduced maintenance costs
5. Good for interfaces
6. Modeling capability

Source: Ovum Ltd.

Even more unusual is that Kash n' Karry used public domain or freely distributed software, available on the Internet, to build its new object-oriented language, database and tools. The company turned to academic institutions instead of vendors for advice and help along the way, in part because there was so little commercially available software to choose from two years ago.

"Commercial software lags behind public domain software in capability and adaptability, and that's still true today," Stikeleather said. "We had the money to buy CASE tools, but they tend to dictate their view of an object and [were] not what we wanted. Also, a lot of object-oriented tools are not multivendor-oriented."

In fact, the more his development team explored available products, the more convinced they became that creating their own tool sets would best serve the company's plans.

"Most people really don't understand what we're doing because it's so far [out] in left field from data processing," Stikeleather said. "But they recognize the results."

Among those results is an object-oriented warehousing system in production today at Kash n' Karry's Returns Processing Center (RPC), which Stikeleather's 17-person staff built in four months. The new software system, which processes up to 50,000 transactions a day through a Sun Microsystems, Inc. SPARCstation 2 workstation, led to a 35% productivity savings and eliminated the $90,000 annual bill for the third-party vendor system it replaced.

Another result is a promotional pricing system, called PromoMan, that 60 store buyers are now using. It was built in six weeks using Kash n' Karry's object technology, after two mainframe programmers abandoned a two-year effort to create the same sort of application.

"PromoMan has allowed me to do things like pull information from disparate databases throughout the organization," said Einar Seadler, director of marketing at Kash n' Karry. "Instead of my people being scared to have a computer on their desk, they're demanding to have one."

Closer look

Dawn Boneham, a former mainframe programmer who made the jump to Stikeleather's development team, said the group is in a constant "research mode" as it explores available tools and software technologies. "If something looks good on the PC or on the mainframe, we should look at it," she said. "We have to be able to pick up any language or operating system and pull out things we could use."

When Stikeleather describes the reaction vendors and visitors have once they see his object technology in action, he paraphrases science fiction author Arthur C. Clarke's observation: "Any sufficiently advanced technology appears to be magic."

"MIS executives see the results we've gotten, and they want their people to learn the magic," he said. Some of his colleagues will hear Kash n' Karry's story firsthand next week in Tucson, Ariz., when Stikeleather addresses a chief information officer conference.

One issue he will address is the organizational upheaval that often accompanies dramatic shifts in the way a company develops new systems. When Stikeleather began Kash n' Karry's object quest two years ago, there was a 70% staff turnover in the first six months as programmers decided whether to be part of this new "information architecture."

Programmers are rewarded for "wiring together" objects, not for writing code. One of their new credos is: "If you write a piece of code more than once, put it in a tool."

"What they're doing is really bleeding-edge. They've done their own language, built their own tools and database and written their own messaging and distribution system," said Chris Stone, president of the Framingham, Mass.-based Object Management Group (OMG), an industry standards consortium.

Last year, Kash n' Karry's RPC won an OMG award for the best implementation of a distributed application using object-oriented tools.

Stone stressed that object technology has matured greatly in the past year or so and that getting "locked into somebody else's data model" is less of a concern today.

"Jim took a risk on using new, unproven technologies, and he won," Stone said. "MIS executives should always investigate options [in public domain software], but they have to be prepared for the support and a lot of development work."

To answer the usual vendor response about free software — "you get what you pay for" — Stikeleather insisted that support problems are often exaggerated. Calling a software vendor's help desk, he noted, may take several hours to a few days to get the right answer. But broadcasting a message for help on the Internet — directed to the special interest group closest to the software — often delivers a highly specific, detailed answer.

Kash n' Karry Food Stores
Tampa, Fla.

Retail grocery chain with 115 stores throughout Florida; carries 60,000 items.

Employs 10,000 and generates annual sales of $1.2 billion.

'New Information Architecture' staff of 17, with $1.2 million annual budget. All new development adhering to industry standards, including X/Open Co.'s X/Open Portability Guide (XPG3 & 4), MIT's X11R4 windowing standard and ANSI C++.

Development systems: 30 Sun Microsystems, Inc. SPARCstations and servers.

Current hardware platform: IBM Enterprise System/9000 mainframe, with 200 X Window System terminals. Apple Computer, Inc. Macintoshes in advertising.

Innovation n' adaptability

Kash n' Karry's Unix-based Information Architecture is a five-year effort that will culminate in 1996 with a re-engineered company running on object-oriented, standards-based information systems.

"People still think of an information system in terms of a database, but this is much bigger and overarching," said Jim Stikeleather, director of systems development at Kash n' Karry. "The new architecture will include every piece and type of information, and all the facilities any employee would need to view and manipulate the information."

One key goal is to eliminate the IS department from the "business-critical paths" because users will be able to assemble their own applications like Lego blocks, selecting objects from the company's home-built ObjectManager repository database and establishing their own rules of behavior for the objects.

Critical business functions such as payroll and accounting will remain on an IBM Enterprise System/9000 mainframe for the next few years, but mainframe-based applications will no longer drive the company, he added.

During the past 18 months, the programmers — now renamed "information engineers" — created their own object-oriented language, tools and database with freely available software, including NASA Clips, a database inference engine; Stanford University's Interviews, a presentation engine; and Carnegie Mellon University's Garnet, a LISP-based programming language for prototyping.

The core of the ObjectManager repository is an Informix Corp. relational database management system. An additional 3,500 lines of C++ and SQL code, added by Kash n' Karry developers, isolates object-oriented programming from specifics of the Informix database.

—Maryfran Johnson

Microsoft to link Windows, PBXs

By Elizabeth Heichler
LONDON

Microsoft Corp. has announced that it plans to extend Windows to office telephone systems with the release of a new application programming interface (API) to Windows. The interface will eventually let users integrate the functions of their private branch exchange (PBX) systems and telephones into Windows-based local-area networks.

A prototype application that uses the new API to let a Windows-based PC control an office PBX has already been developed in Germany and could be demonstrated at CeBIT '93 in Hannover, Germany, next month, according to Christoph Marloh, senior consultant at Microsoft Consulting Services in Germany.

The application was developed by German firm CSB-System Software Entwicklung & Unternehmensberatung GmbH with input from one of Germany's largest retailers, Kaufhof Holding AG. CSB is helping Kaufhof replace its telephone system with desktop PCs and Windows, Marloh said.

Just as calculator icons in Windows have replaced the electronic devices that used to sit on many desks, so a telephone icon on the Windows desktop will replace the familiar handset for Kaufhof's users, said Ralf-Rainer West, chief information officer at Kaufhof.

The company is providing users with audio-equipped Windows-based PCs from which users can simply select a telephone icon to bring up an application that dials and manages phone calls for them. The PCs are connected by a Novell, Inc. LAN gateway to its PBX.

Heichler is the IDG News Service's correspondent in London.

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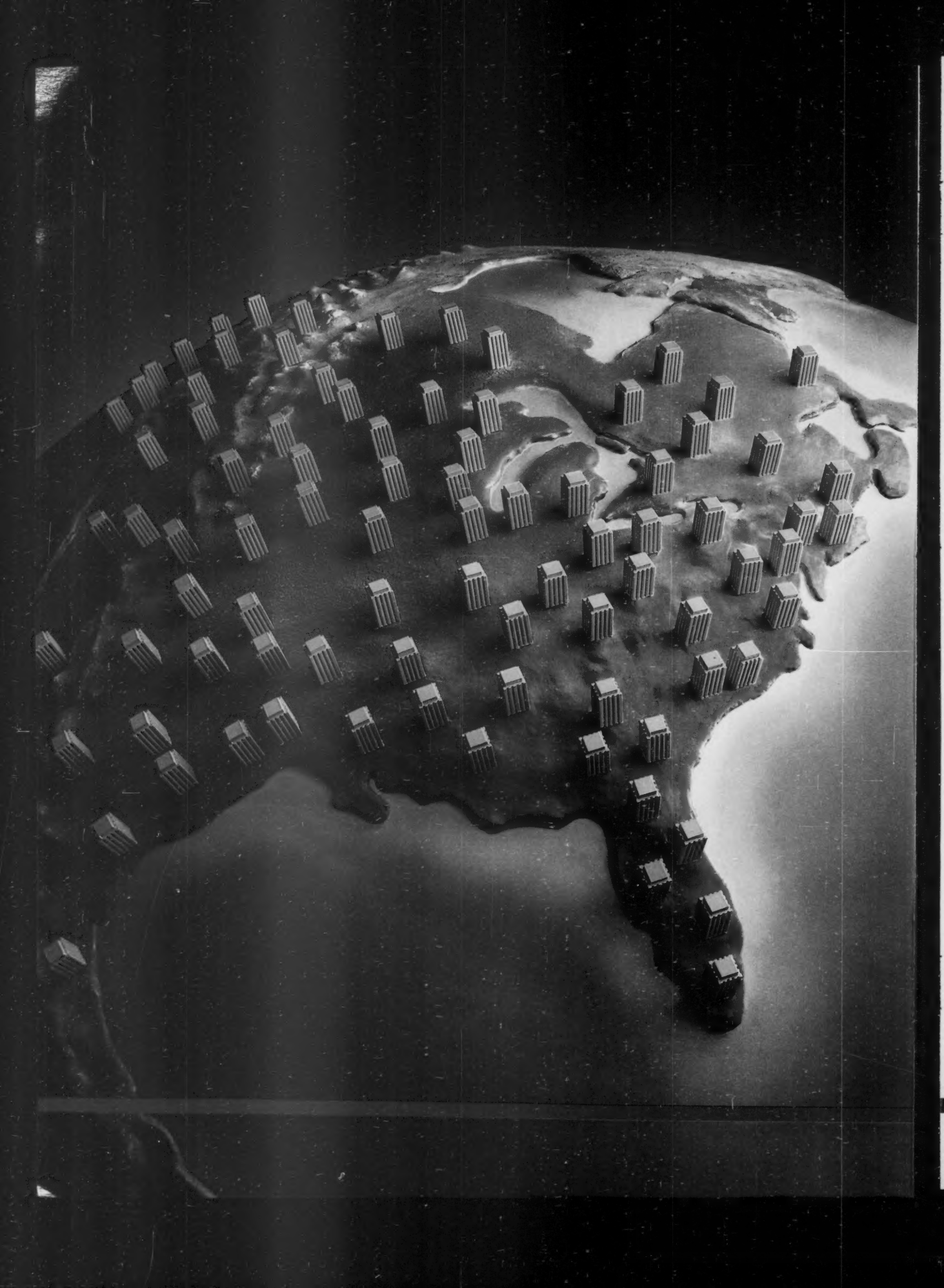

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Tech Talk

PC telepathy?

Could a computer be controlled one day by thought alone? Fujitsu Ltd. is looking into this question with research that seeks to detect so-called "silent speech," a mental state that occurs just before speaking. Test subjects wearing a specialized array of electrodes on their heads were seated before two light-emitting diodes, one red and one green. While keeping still, they were instructed to "think" only when one of the two colors blinked. According to initial test results released last October, brain waves were detected at the back of the head 0.3 seconds after the subject had seen the designated light and at .42 seconds in the front of the brain, where the cognitive and action centers are located. Future tests will do away with electrodes.

On display

R2-D2, the diminutive *Star Wars* robot, was inducted into the newest gallery at The Computer Museum in Boston last month. Stocked with 25 robots and almost 30 interactive computer stations, "Robots & Other Smart Machines" features such famous computer programs as Eliza, the "nondirective" psychotherapist, and SimLife, the artificial ecosystem. The permanent gallery is supported by the American Association for Artificial Intelligence and Digital Equipment Corp., among others.

Leading role

A role for Integrated Services Digital Network (ISDN) in multimedia? Last month at Communication Networks Conference and Exposition '93 in Washington, D.C., Bellcore demonstrated MediaCom, an icon-based software package that uses an ISDN telephone line to carry voice, fax and electronic mail, as well as to set up conference calls with up to six people. Eventually, MediaCom will be able to handle full-motion video, predicted Bellcore, which is licensing the system.

Light shines on optical

University shows first system using light to process, store data

By Ellis Booker

OPTICAL COMPUTING TOOK a historic step forward last month when researchers at the University of Colorado announced the completion of a "proof-of-principle" machine that both processes information and stores data using light instead of electricity.

The university's Optoelectronic Computing Systems Center (OCSC) heralded its system — a desk-size device crammed with fiber-optic lines and optical switches — as the first general-purpose optical computer.

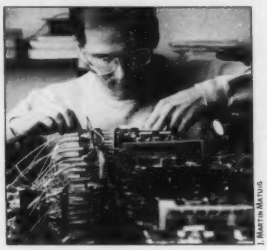
Two years ago, AT&T Bell Laboratories demonstrated a simple optical processor, but that system used an external electronic computer for program control. The breakthrough in the OCSC device is that data is never stored physically but is always "on the fly" in the form of light pulses (see story below).

Harry Jordan, a professor of electrical and computer engineering at the University of Colorado at Boulder, who along with Vincent P. Heuring heads up development at the OCSC, said the advantages of fully optical computers are twofold.

Why it's better

First, unlike light photons, which travel at the unvarying speed of 186,000 mile/sec., the speed of an electron is compromised by capacitance and inductance, which vary according to the material at hand. The practical speed of an electronic signal on a chip is roughly one-fifth the speed of light, Jordan noted, adding, "And when you go off the chip into a wire, things slow down even more."

A second advantage is that this kind of computer, in theory, can interconnect a virtually limitless number of optical switches in "free space."



J. Martin Matus

The OCSC's optical computer *uses only a single channel*

Such an architecture maps to the current interest in massive parallelism for some kinds of computations.

AT&T's system used "free space" interconnection between optical switches and had between 16 and 32 parallel channels. The current OCSC device has only a single channel because it connects processors physically with fiber optics.

"We're already interconnecting cabinets with fibers. Soon we'll be connecting boards with optics and then chips," said Jordan, who is bullish on the application of optics in general-purpose computing.

Thomas Cathey, director at the OCSC, goes so far as to predict that optical computers will become a commercial reality in the next several decades. Like Jordan, Cathey said he feels that the shift to optical will occur gradually.

Formed in 1987, the OCSC is funded by the National Science Foundation (NSF), the Colorado Advanced Technology Institute and industrial affiliates. It is the only one of the 18 NSF Engineering Research Centers devoted to optoelectronic computing.

Quantum leap

Paralleling advances in optical computing are developments in quantum particle physics that could lead to radically faster electronic circuits.

Yale University electrical engineer Mark Reed has proposed gating devices that could force the electrons in an electrical circuit to march single file through a wire. These devices would contain a "quantum dot" — an infinitesimally small box that can capture and hold a single electron.

Reed, who invented the first quantum dot and whose lab has already succeeded in building semiconductors just three atoms wide, speculates that with the addition of gates, quantum dots could be made to start and stop a flow of electrons. Millions or even billions of these boxes might then be linked — using technologies not yet explored — and made into a calculating engine: a computer.

What do optical computers do?

Five years in the making, the University of Colorado at Boulder's bit-serial optical computer is about the size of a large desk and contains lasers, electronic switches and optical fibers arranged in layers.

Data is encoded as light into hundreds of thousands of light pulses, stored in some three miles of spooled glass fiber.

Each "bit" of information is carried in a 12-ft long light pulse, which traverses the memory spool every 20 millionths of a second, giving the system a 50-MHz clock speed. As in electronic computers, information is represented by 1s and 0s. In the optical computer, 1s are pulses of light and 0s are the absence of light pulses. The current system works with 16-bit words, the same as an Intel Corp. 8086 processor.

Simple calculations are performed by the machine's 66 AT&T optical switches, which can be turned on and off millions of times per second. The pulses are synchronized by the unvarying speed of light.

Flushed with excitement over the success of their project, the university's OCSC predicted a number of real-world applications for devices of this type "on the immediate horizon":

- A telecommunications processor comprised of the bit-serial optical computer on a cylindrical wafer 3 in. in diameter that would operate at 20 billion clock pulses per second.
- A high-speed graphics processor that uses millions of optical switches interconnected in free space using mirrors rather than through glass fiber.

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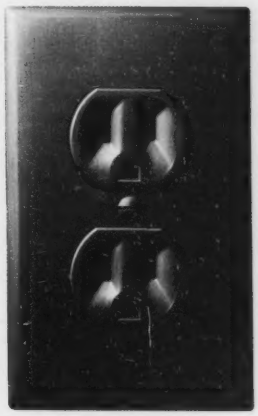

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Buyer's delight?

Last month I met with some software executives who were touting their company's telemarketing sales efforts. The firm has been pretty successful in using the direct-marketing approach, as have scores of companies hawking PC hardware and software.

Only this was not a PC company but one selling mainframe database management system products. One recent phone sale netted an $800,000 order. Can you imagine buying that kind of product over the phone? Apparently a growing number of users do so, and by all indications, they are very happy with the outcome, as evidenced by the growth in virtually all distribution channels for an increasing variety of products.

As we've noted ["Changing Channels," CW, Feb. 15], corporate buyers are cozying up to alternative channels in unprecedented numbers. The image of a corporate buyer prowling the cavernous halls of a warehouse buying club to strike a deal on 100 printers would have been utterly out of context just a short time ago. But not anymore.

Channel mainstays, such as vendor direct sales and traditional computer stores, are still the buying venues of choice for corporate IS. But the growing use of the array of alternatives is gaining favor and, with this change, is developing challenges that have caught some IS buyers off guard.

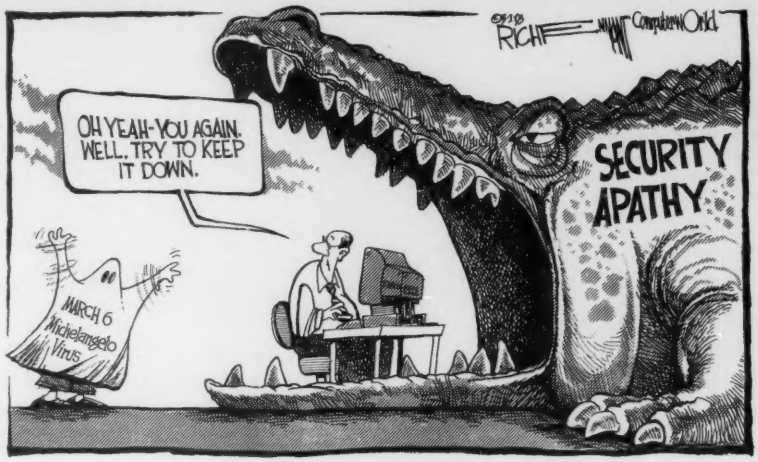
For example, the most preferred channel remains vendor direct sales, even though it isn't the most frequently used. Why? Because it is the most expeditious, and IS has traditionally purchased most of its equipment that way. As a result, it's probably correct to assume the channel is used more than it ought to be, and some of the channel data bears this out.

In addition, the expanding channel choices have encumbered an already heavily encumbered IS community with the burden of honing negotiating skills. This might seem trivial at first. But negotiating in alternative channels is far different than dealing directly with your vendor rep. The difference is akin to the experience of refinancing your home. The most direct and easiest route is through the bank. The mortgage companies can offer better deals but going that route requires you to become a much more astute shopper.

Finally, while the widening of distribution channels has generally meant more efficient pricing for the user, the levels of technical support from channel to channel vary from blanket coverage to "we sell the screwdrivers in aisle nine," meaning nonexistent. With internal IS support staffs either flat or shrinking today in most organizations, the allure of the lowest priced channel can be nothing more than a tender trap — which someone needs to explain to the CFO.

Bill Laberis

Bill Laberis, *Editor in chief*



Metrics misuse

Michael Schrage is certainly correct in his assertions that metrics can be and frequently are overplayed ["Metrics: The art of the well-supported lie," CW, Feb. 8]. However, he is missing the point when he states: "We should seek software metrics — and distrust them." In truth, we should seek software metrics — and *understand* them!

The risk in measuring development (or support) productivity is in using the results as blind measurements to place the "good" or "bad" label on the work being performed.

Software development is as much a process as a tool, and the resulting product is never identical to any other resulting product. We can get some measurement of the process involved, but we surely should not hang our hats on the results. The key is to evaluate the entire process, compare the outcome with as many other similar organizations as possible and look for those places where the normalized information (data made comparable by carefully mapping to equivalent bases) indicates *significant* deviations from an average or set of norms.

Too much emphasis is put on those 10% deviations. Let's look for the places that we are 40%, 50% or more away from what might be expected. Then we should be able to identify the key issues and see what is causing such deviations.

Drawing conclusions from one statistic is like forecasting the weather based on the wind speed. It is the understanding of the complex interaction of *many* metrics that begins to provide useful information to the systems manager.

So let's not blame metrics as the villain — place the blame on the people who misuse them!

Richard W. Taylor
Darien, Conn.

Better luck Next time?

In your Feb. 15 issue, I found two amusing contradictions in your coverage of the recent "changes" at Next, Inc.

First, on the same page that covers these changes in the article "Next KOs workstation line," a glimpse of the upcoming Buyers' Scorecard is offered that compares four desktop operating systems: Apple System 7, Microsoft Windows 3.1, SCO Unix Open Desktop and IBM OS/2 2.0.

I find it ironic that on the same page that NextStep is praised by "users" and your interviewees, it was left out of your survey.

Second, your editorial "Bridge too far" refers to an SAS Institute programmer whom you believe would be saddened by the news that Next is terminating its hardware business. I highly doubt that he was referring to Next's hardware but rather was actually praising NextStep.

If you could put DOS on a Macintosh or a Next machine, I highly doubt that any Macintosh or Next user would still praise his machine.

Franklin Rimalovski
Durham, N.C.

OS/2 sensitive?

I just read "Easy as 1-OS/2-3" [CW, Jan. 11] after reading the angry letters from the OS/2 crowd in subsequent issues of *Computerworld*. Just to add a voice to the fray, I thought the article (prominently marked "Humor") was a scream! As anyone who has installed OS/2 many times, I can relate to the story.

Trying to write humor about OS/2 is like trying to poke fun at a particular religion. For people who have staked their sustenance and careers on whether OS/2 works and whether they can sell their OS/2 applications when they finish them, OS/2 is not a laughing matter.

In order to keep management interested in their project, many have turned into nothing short of evangelists. The trouble with evangelists is that they tend to reject dissimilar beliefs and opinions as invalid or, worse, heresy.

It's strange, though, that although Unix proponents can be just as evangelical regarding the holy mystery of Unix, they seem to have a much better sense of humor about it. I guess after OS/2 has been around for 20 years, we'll see the situation ease up a bit.

Greg Stricker
St. Louis

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Abandon the end user at your own peril

Joanne Kelleher

There's a very big difference between cutting corners and cutting your own throat, but it is beginning to seem like some IS executives are missing the distinction.

Faced with what feels like an either/or choice between all-out production of revenue-generating systems and ongoing support of end users, more than a few IS chiefs are choosing to leave the end users to their own devices. Something has to give, they say. Budgets aren't going up by much — if at all — while ideas for strategic projects keep pouring through the pipeline. Handholding just isn't a strategic priority.

All of this is true, of course . . . well, all except the last part. These are hard times. Resources are stretched. There aren't enough trained bodies to go around. And it is never easy to tell a top corporate executive that the system he's convinced will fatten the bottom line or shake the teeth of the competition won't be ready for several months. But even so, cutting users loose to handle most of their own support is not smart. It may even be suicidal.

Picture this: We're looking at a business department recently "empowered" by IS. It has been three weeks since IS cut the cord, and things have been going along swimmingly. Suddenly a persistent error message begins to rear its head each time a user tries to perform a certain routine function. Work grinds to a

Peter Hoey

halt. Co-workers gather. A call is put out to the department's power user, the regional sales director, who happens at the moment to be preparing an urgent report on competitive incursions in his territory.

As the de facto Answer Man for computer problems in his department, the sales director can't easily say no. So four hours later, he's still bent over a PC trying to figure out what's triggering that rogue message. His report lies half-finished and forgotten on his own desk.

Is this sensible? Is this productive? Don't you think there's going to be a backlash?

Let's face it. When people don't get service, they shop someplace else. The only exceptions are monopolies, and IS departments don't have that power anymore.

User departments have the machines, and in many cases, they are working with software that comes in a plastic wrapper. They have the means and the will if pushed to look elsewhere for development or support services. Hell, they may even hire their own system wizard to keep on the premises, given enough provocation.

It is important to watch the budget and important to keep the big bosses strategically satisfied. But if you turn your back on your real customer base, you are asking for trouble.

Being reviled or replaced aren't the only negatives. Probably the most insidious consequence is the loss of connection with the actual process experts. Most of the really interesting new system concepts aren't found in the executive offices. The best schemes for shaking up processes, cutting time and building value from information are bubbling around in the rank and file.

Every request for application development assistance, every call for system support is an opportunity to tap into process change at the source. Do you really want to send your regrets?

Kelleher is *Computerworld*'s features editor.

Not sure what you're doing? Join the crowd

FIRE WATCH *by* John Gantz

Let's face it: All our role models are gone. We're adrift. Computer vendors are trying to figure out how to manage their businesses with the gross margin structure of a Deli Computer. User organizations are all trying to organize the chaos of distributed computing. Everyone has a theory or a plan, but no one has proof of success.

This reality first hit home while I was sitting on a panel at ComNet '93, listening to Mike McKenna, a vice president and technology planner at Citibank, discuss that company's massive IS reorganization.

> All vendors are in experimental mode these days, trying new business models with no assurance that their tinkering will pay off.

A little over a year ago, Citibank came to the conclusion that its decentralized computer operations had to go. Autonomy was costing more than it was worth.

The company decided to put all of its IS professionals in one department, locking departmental IS budgets and consolidating data centers. Having made that decision, it took less than a year for the company to get rid of about 100 IBM mainframes — half its complement.

So now Citibank, once a role model for decentralized IS, is now a role model for consolidated IS. But which Citibank should you emulate? The one that set the standard for decentralization or the one cleaning up a decentralized mess?

Figuring out who or what to emulate is no easier for vendors. I sat on another panel recently and listened to Duane Walker, Windows NT marketing manager at Microsoft, and Mark Benioff, vice president of advanced technology at Oracle, argue about what it will take for software companies to be successful.

Walker's take was that because of falling prices, the only worthwhile way to go will be selling low-priced software to high-volume markets. Software companies that try to be all things to all customers will fail.

Benioff had a different answer. For a software company to succeed, he said, it will have to sell value-added services and "solutions" to customers facing increasingly complex computing environments.

Which model is right? A single-function company relying on the distribution channel and partners to turn its products into solutions or the "one-stop shopping" company with close ties to customers?

Who knows? Who knows anything? All vendors, including IBM and DEC, are in experimental mode these days, trying new business models with no assurance that their tinkering will pay off. Microsoft sure looks like it's got the inside track to success today, but a catastrophic bug in NT or a car accident in Redmond could change things tomorrow.

I'm not sure I'd want to bet my company on any of the role models out there.

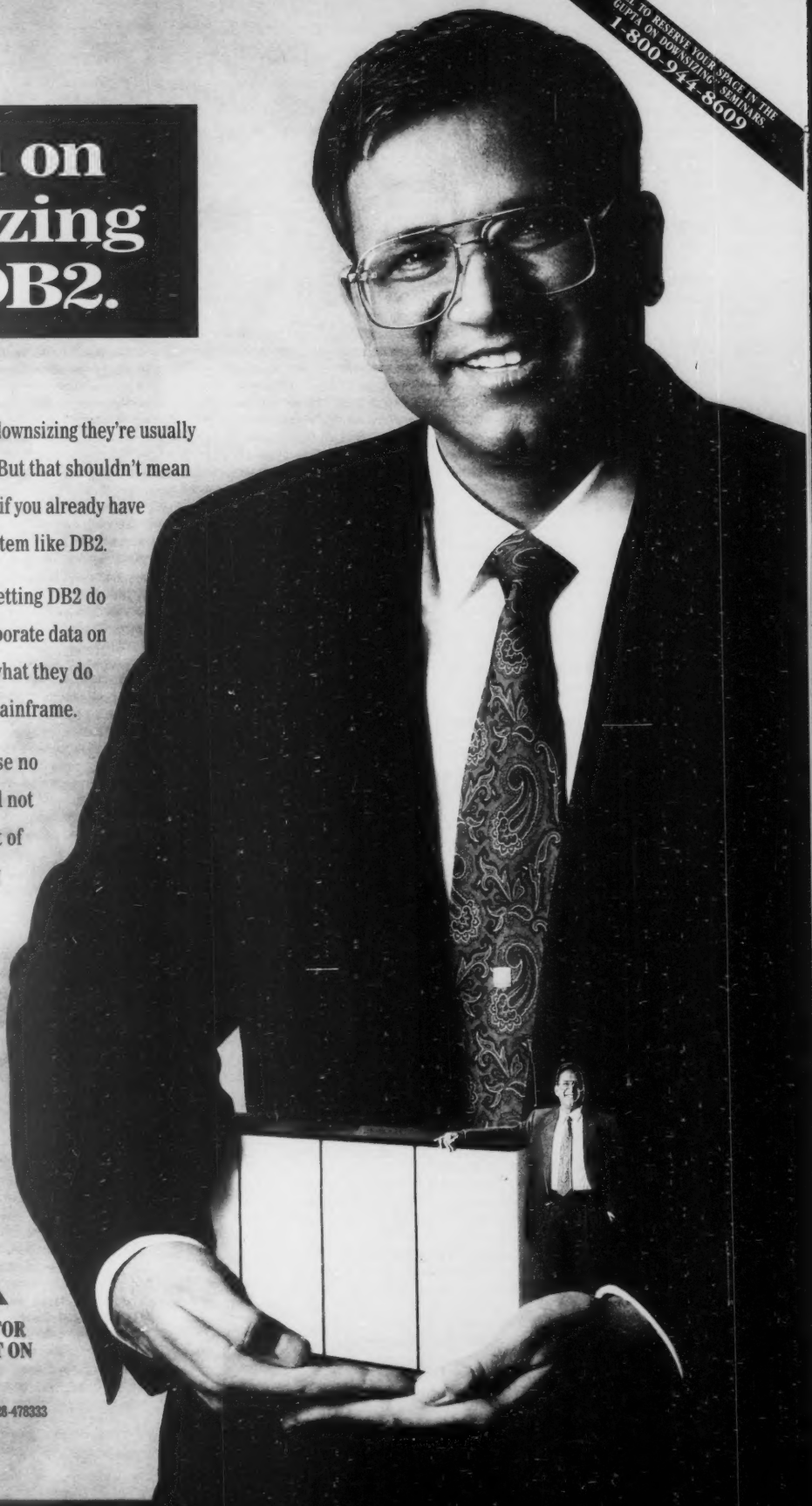
For IS professionals, the message is this: You'll need the skills of advocacy to get through this period. There's opportunity as well as danger in chaos. But pursuing that opportunity in a time without role models is more a matter of being convincing than being right.

When McKenna got higher-ups at Citibank to buy into IS consolidation, he didn't do it by talking about terabytes or gigabytes. He did it by talking about impact on earnings. Walker and Benioff may both be wrong, but they each make a convincing case for their point of view.

Keep it in mind. Until things settle down — if indeed they ever do — to be successful, you'll have to package and market your ideas like any other businessperson trying to deal with change.

Gantz is senior vice president of International Data Corp., where he is responsible for all research and consulting in desktop automation and workgroup and office computing.

Gupta on downsizing with DB2.



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Charles Babcock

NT: Design dilemma

The current widespread anticipation of Microsoft's Windows NT underestimates the multiple — and at times contradictory — goals of its design.

Both early implementers and authors who have examined the strategy behind the product say Windows NT is likely to emerge as a very different operating system than what many users expect. Its adoption may be slower than we've seen with previous Microsoft launches, and there may be more room than predicted for competition from OS/2, Solaris and UnixWare.

PC users tend to perceive Windows NT as just a feature-rich addition to the Microsoft family of operating systems. First there was MS-DOS; then Windows layered the GUI atop MS-DOS. Windows NT, in this view, is just a full-fledged, backward-compatible, power user's version of Windows. Underneath the interface, however, Windows NT is something "radically different," according to Helen Custer, who wrote the book *Inside Windows NT*, published by Microsoft Press.

Top of the class?

Windows NT may look like plain vanilla Windows, but it is larger and more complex, a kind of Stanford Ph.D. in a family of Parsons College graduates.

While definitely meant for the PC power user, Windows NT also embodies grander ambitions and addresses layers of computing and networking above the stand-alone desktop. It was designed to run on powerful hosts such as Silicon Graphics' MIPS R4000 or DEC's Alpha, as well as PCs and workstations. And for that reason, Windows NT has been endowed with some mainframelike capabilities, such as C2-level security and symmetrical multiprocessing.

These capabilities, important as they may be, do carry a cost for the average user. For example, virtual memory, an alien concept to MS-DOS, is required. Also, Windows NT can achieve its goal of C2-level security only at the expense of losing some backward compatibility with MS-DOS and Windows. Many DOS and Windows applications or device drivers seek to control the underlying hardware, and a C2 security prohibits release of control over the hardware.

Finally, many PCs will simply be too underpowered to run Windows NT. At minimum, Windows NT is likely to require a 486 CPU with 16M bytes of RAM and a 100M-byte hard disk. That's already more power than many PC managers plan to purchase in the near future, and it may not even be enough. According to Computer Technology Research Corp.'s report "Windows NT: Microsoft's New Operating System Strategy," Microsoft advises that "an additional 50M bytes should be set aside as swap space."

IBM's OS/2, which offers many Windows NT-like capabilities, runs on 8M bytes of RAM and 30M bytes of hard disk. OS/2, of course, was regarded as a resource hog when it first came out.

There are many long-term advantages to the Windows NT design, particularly as the outlook for client/server systems takes shape.

Someday, it will matter greatly that Windows NT can run MS-DOS, OS/2, Windows and Windows NT applications, along with Posix-compliant Unix applications. But right now, many PC managers, gazing at the sheer scale of Windows NT, are going to ask whether they really need all this and whether Microsoft couldn't have invested more in Win/32, Windows for Workgroups and Windows itself before urging users to upgrade.

In the end, Windows NT may vie with Windows OT for desktop predominance. (That's OT as in Windows Old Technology.) An enhanced Windows environment running 32-bit applications might enjoy as long and full a life as MS-DOS.

Babcock is *Computerworld*'s technical editor. His MCI Mail address is 575-2737.

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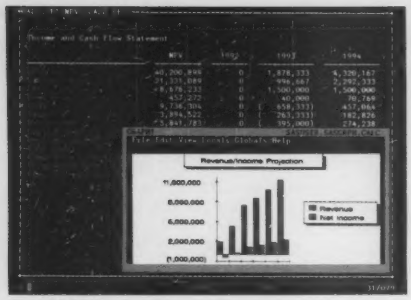

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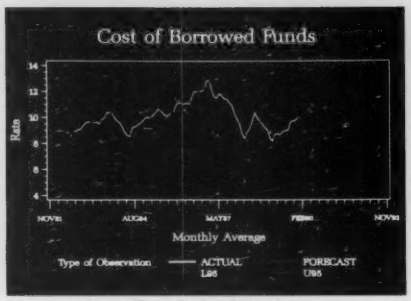

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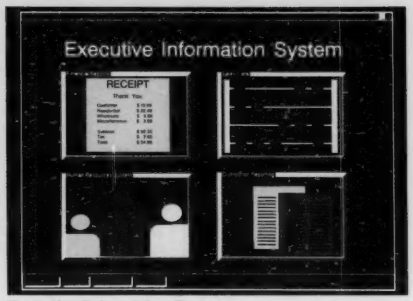

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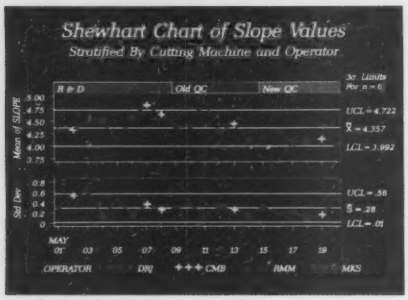

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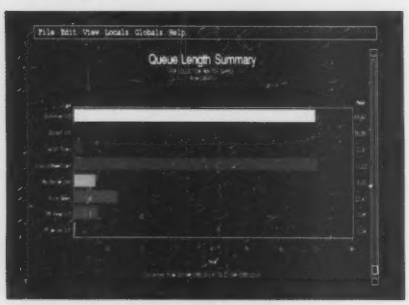

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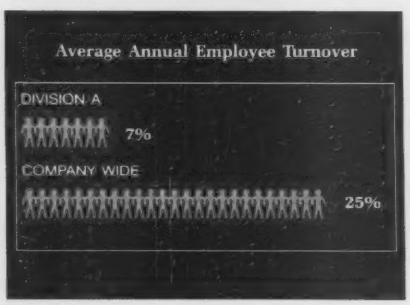

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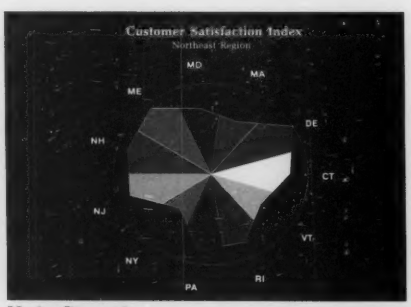

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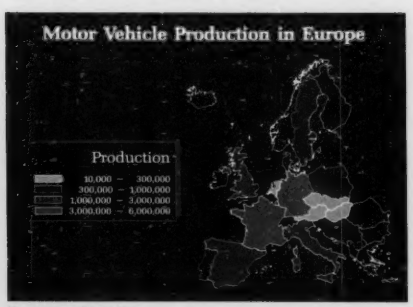

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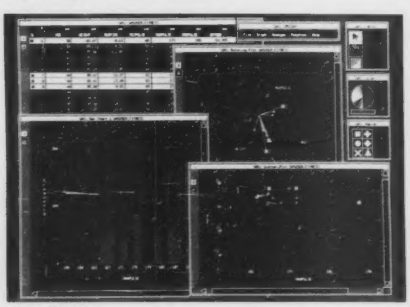
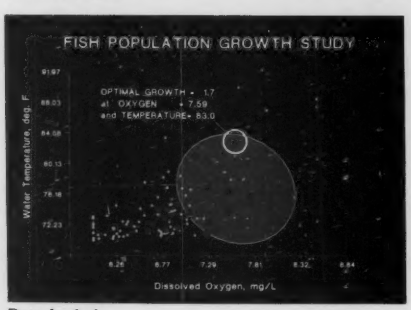


Visualization



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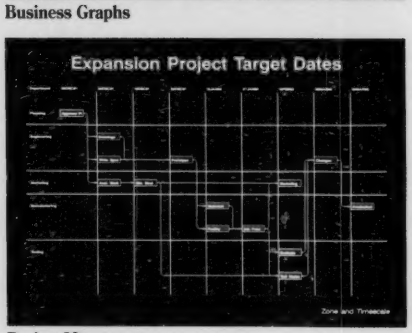


Project Management

Paul Gillin

Bytes to burn

If you're as fanatical a PC user as I am, you can't resist installing every piece of software you can get your hands on.

You've probably also discovered that Windows and OS/2 software packages aren't exactly sparing of disk space.

The 120M-byte disk drive on my machine — which looked so spacious 18 months ago — became downright puny last fall. That's when Iomega Corp.'s products entered my life. The Roy, Utah-based pioneer of removable storage products has come up with the Multidisk, a 150M-byte removable hard disk that attaches via a SCSI port to your PC or Apple Macintosh. The cartridges weigh only 5 ounces.

This product is a screamer. Performance is almost indistinguishable from that of a Winchester disk drive, largely because of a nice caching program Iomega includes with the driver software. With compression software, you can squeeze 300M bytes onto a single pancake-size cartridge.

Power users and IS departments will find a lot to like in the Multidisk for some applications. If you don't want to tie up your network transmitting giant graphics files, the Multidisk lets you store them on a disk for transporting via "Sneakernet." Users who do a lot of on-site work at client locations will find it handy to be able to carry programs and data in their briefcases between home office and customer site. And users like me who run more than one operating system can store their applications on different disks and pop in the appropriate files at boot time.

Iomega is also targeting network administrators with the Multidisk because the device can be configured as a boot drive. Basic network files such as the E-mail structure and print drivers can be stored on the removable cartridge so the network can be rebooted

Gillin, *page 38*

486s take over notebook market

386 prices expected to drop to $1,000 as vendors clear out low-end stockpiles

By Michael Fitzgerald

■ Recent trends show a dramatic shift to Intel Corp. i486 technology in notebook development, and prices are inching down toward $1,000 for a low-end notebook.

The pricing plunge is most evident as vendors such as Compaq Computer Corp., Zenith Data Systems and others have cut prices on their existing models, particularly 386SX-based models.

Vendors grudgingly acknowledged a spiral in pricing that will probably see widespread sub-$1,000 pricing of a 386SX notebook with a 60M-byte hard drive and 2M bytes of random-access memory by year's end.

The trend is widespread. Even a big-name player such as Toshiba America Information Systems, Inc. now sells a 386 notebook for $999, using a rebate program.

"By July, there'll be a huge shift going on," predicted Steve Lair, vice president of marketing at Irvine, Calif.-based Toshiba. "The 386 products in the color version will still be viable, but monochrome versions will be priced to liquidate from most vendors, I expect," he said.

Fast drops

Even notebooks based on the pricey 386SL will drop in price rapidly.

"You'll definitely see SLs down at a thousand bucks by year end," said Daniel D. Sheppard, director of notebook product marketing at AST Research, Inc. in Irvine, Calif.

Sheppard said $1,000 is becoming a magic price point for notebook buyers.

Lair and Sheppard predicted massive volumes for notebook computers this year. Analysts agreed with them.

"We are seeing a shift to the 486 in notebooks. It's been coming on pretty fast starting near the end of last year," said Richard Zwetchkenbaum, an analyst at International Data Corp. in Framingham, Mass. Zwetchkenbaum said the shift to the 486 on the desktop was accelerating the move to the 486 in the notebook market as well, particularly at corporations that use Microsoft Corp.'s Windows.

At the same time, Zwetchkenbaum said, price cutting was not the early salvos of a notebook price war. Rather, he said, most companies were cutting prices as they ready new notebooks based on the 486SL or 486SX processors.

"I expect midsummer will bring a massive shift to the 486, and that will be the volume leader in notebooks by the end of the year," Lair said.

Happy users

Users reacted favorably to the thought of lower priced machines, and several said price competition might allow them to buy full-fledged 486 systems in place of 386SX notebooks.

"It's a good thing for us," said the PC coordinator at a large multinational company who asked not to be named. "About a year ago, notebooks didn't have enough speed," he said. According to the user, because his company buys only one machine per person, faster processors will help justify the purchase of notebooks in place of desktop machines.

"We've pretty much shifted all our users to the 486 on the desktop, and that carries over to our notebook purchases as well," said Dawn Kroll, technical buyer at Chemical Bank, Inc.'s Geoserve division. If employees "are in a Windows environment on their desktop and they're used to that, it's easier to justify the additional cost," she said.

Kroll added that 486 notebook pricing was falling, along with prices on 386 notebooks.

Not all users are pleased with faster cycle time from the 386 to the 486. "Every time we find a nice machine and get our users used to it, it gets discontinued," said Bart Everett, deputy systems editor at the Los Angeles Times. Everett said that for his users, most of whom are reporters, faster processors are not an issue.

InTouch graphically manages work flow

By Christopher Lindquist

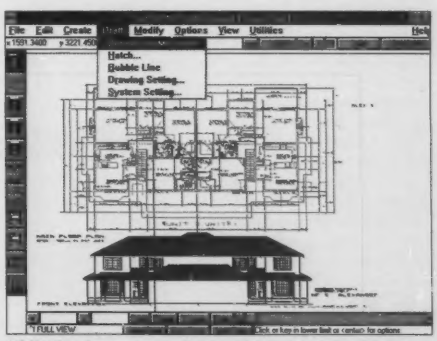
Rooms, desks, reports, calendars, forms, letter trays, Rolodexes: These are the common building blocks of any office. But what if the reports could automatically summarize the information held in the trays? And what if those trays were smart enough to automatically attract information needed by the tray's creator?

Such a situation is the goal of InTouch, a work-flow application development environment produced by InTouch Software in San Rafael, Calif. InTouch was designed to allow users to graphically create an electronic model of an office environment using common representations of keys, doors, desks, trays and forms. These "objects" can be placed inside floor plans that can be made to look just like the actual office layout. In this way, the jump in logic from the real world to the world on the screen is shortened over traditional graphical applications.

InTouch may not be for everybody. While the world is moving to Windows, InTouch is still based on DOS (though it will run under Windows).

Users said that despite its power, InTouch is easy to use. Bruce Kohen, a senior partner at Anesi, Ozmon & Rodin in Chicago, said he has done a great deal of development with InTouch since his company purchased it several years ago. "And I'm still a lawyer, not a computer expert," he said.

Kohen said his office uses InTouch to integrate accounting, docketing and word processing into one system. "It has been very successful," he said.



With InTouch, *a user can drag and drop a memo onto the president's 'desk' without getting up from the computer*

InTouch uses customer-defined rules to control the behavior of objects. For example, a sales manager's "in" tray could have a rule attached to it that says, "If a sales order's grand total is more than $5,000, attract it here."

Such actions can also be taken manually: A secretary could drag and drop a memo onto the president's "desk" for approval.

Security in InTouch is accomplished by applying "locks"

InTouch, *page 39*

Beware of Michelangelo in March

Later in the month, be on the lookout for Maltese Amoeba

By James Daly

Guess who is back? Our good friend the Michelangelo virus.

One year after it became a notorious celebrity, Michelangelo again rears its ugly head on March 6 — the birthday of the Renaissance painter and sculptor. This year, however, Michelangelo will strike on a Saturday, thus becoming more of a threat to home, rather than business, users.

Michelangelo leads a trio of virulent strains in a month peppered with mostly nondestructive nuisance varieties, according to officials at Fifth Generation Systems, Inc., a Baton Rouge, La., developer of data security software. Michelangelo is a memory-resident infector of disk boot sectors and hard disk partition tables. It is roughly based on the Stoned virus, although it is very different in its behavior.

The virus goes into memory the first time the user attempts to start the computer with an infected disk. Once it is memory-resident, it will infect disk boot sectors as disks are accessed. It will also infect the hard disk partition table as the user attempts to access a file on the hard disk. On March 6, Michelangelo will format the entire system hard disk by overwriting it with random characters from system memory.

On March 15, keep an eye out for Maltese Amoeba, a rare destructive virus that also activates on Nov. 1. On activation, Maltese Amoeba overwrites the first four sectors of cylinders 0 through 29 on the system hard drive as well as any disk drives.

Another virus that can crop up on any day in March is the Micropox virus. When a program infected with Micropox is executed, the virus overwrites the system hard disk.

WATCH

Viruses expected to activate this month

March 1, 8, 15, 22, 29
Garfield, Exterminator, Bad Guy, Bad Guy 2

March 2
Ah, Kamasya, Demon, Demon B, Flip, Nuke

March 3, 10, 17, 24, 31
Victor

March 5
Frere Jacques, Smack, Payday, Frog's Alley

March 6
Michelangelo, Finger, Phenome, Migram

March 7, 14, 21, 28
Sunday, Sunday-2

March 8
Taiwan

March 9, 16, 23, 30
Ah, Kamasya, Demon, Demon B

March 10, 20, 30
Day 10

March 12, 19, 26
Frere Jacques, Smack, Payday

March 13
Finger, Phenome, Migram, Monxla

March 15
Maltese Amoeba

March 18
Form 18

March 19, 26
Skism, Skism-1

March 20, 27
Finger, Phenome, Migram

March 24
Form

March 26
Sub-Zero B

Source: FGS Virus Watch — CW Chart: Michael Siggins

PC DOCS for Windows debuts

By Michael Vizard
TALLAHASSEE, FLA.

PC DOCS, Inc. is now delivering a Microsoft Corp. Windows-compatible version of its document management software, which is widely used in legal offices.

Called PC DOCS Open, the system provides an infrastructure for tracking documents created in Windows applications such as WordPerfect Corp.'s WordPerfect, Microsoft's Word and Excel and Lotus Development Corp.'s Ami Pro 1-2-3.

"We decided to go with PC DOCS because it's been a standard in the legal field for a long time, and we needed something that could manage all the different document types we have," said Andi Esposito, office automation systems coordinator for the legal offices of Mobil Oil Corp. in Fairfax, Va.

Esposito added that Mobil was looking for a document management system that could be linked with industry-standard SQL databases. PC DOCS currently supports SQL links to the Sybase, Inc./Microsoft SQL Server, Novell, Inc.'s NetWare SQL and databases from Oracle Corp. and Gupta Corp.

PC DOCS employs a dual database architecture to support text retrieval. A SQL database provides document profile information and a text engine module developed by PC DOCS for indexing and searching.

Network operating systems supported by PC DOCS include NetWare, Banyan Systems, Inc.'s Vines, Microsoft's LAN Manager and Digital Equipment Corp.'s Pathworks. The company plans to add support for Microsoft's Windows for Workgroups and Windows NT, Apple Computer, Inc.'s Macintosh, IBM's OS/2 and Sun Microsystems, Inc. and Next, Inc. platforms later this year.

In addition, PC DOCS intends to integrate work-flow software with its document management system as part of a bid to expand its customer base beyond the legal community, said Michael Safar, PC DOCS product manager.

PC DOCS Open is priced at $299 per client and $495 per server. SQL database software is priced separately.

Electronic tax filing heats up

By Gary H. Anthes
WASHINGTON, D.C.

The Internal Revenue Service reported a sharp increase in automated tax return filing this year and promises fewer processing errors and speedier refunds as a result.

As of Feb. 5, about 5 million returns — more than one third of all those filed — were filed with electronic assistance (see chart). The 1040PC alternative posted the biggest percentage gain over last year.

The 1040PC is a condensed paper format printed from one of several commercially available PC software packages certified by the IRS. The software computes tax due and prints only those lines from the 1040 and supporting schedules that contain taxpayer data. Most returns fit on one page.

The IRS said 1040PCs are filed by taxpayers and processed by the IRS faster and with fewer errors than traditional forms. The form also provides for direct deposit of a refund to the taxpayer's bank account.

A spokesman for the IRS said the IRS is expecting some 6.7 million 1040PCs this year, compared with 1.5 million last year.

In another filing option, called TeleFile, taxpayers can call a toll-free number and enter tax return information through a Touch-Tone telephone during a computerized "interview." The IRS will compute the tax and any refund or tax due while the filer is on the phone. The option is being tested in Ohio for the second year.

In last year's test of TeleFile, taxpayers still had to mail in a special form containing W-2s as well as the taxpayer's signature. In Southern Ohio this year, taxpayers will enter all W-2 data via telephone and will send in a "voice signature" — the taxpayer's name and social security number — attesting to the accuracy of the return. The signature will be stored on laser disk.

IRS on-line

The biggest growth in electronic tax filing is through 1040PC

RETURNS THROUGH FIRST WEEK IN FEBRUARY

	1992	1993	% change
[illegible]	80,000	200,000	150%
[illegible]	4,205,000	4,814,000	14.5%
[illegible]	72,000	75,000	4.2%

Source: Internal Revenue Service

Electronic filing of federal returns by tax preparers for individuals so far this year is up to 4.8 million. In addition, some 300,000 returns were combined federal and state returns from 12 states that offer that option. The IRS expects 14 million electronic returns this year, compared with 10.9 million last year.

Individuals may not file electronic returns directly but must go through tax preparers or other organizations that the IRS has approved for electronic filing.

Gillin

CONTINUED FROM PAGE 37

from a backup server and kept running if the main server crashes.

On the downside, the Multidisk is not for the budget-conscious. The street price for the unit is about $800. Cartridges are $100 each, though that's cheap on a per-megabyte basis. You may also find yourself swapping disks in and out more than you like if you keep a lot of program groups active on your Windows desktop. And many IS managers may blanch at the idea of having so much mission-critical data stored on a format that a user can drop in a briefcase and take home. Still, the Multidisk is a relief for the storage-constrained user.

The more intriguing new Iomega arrival is the 21M-byte Floptical drive. The Floptical combines optical and conventional magnetic read/write approaches to give the user vastly increased capacity on a 3½-in. disk. Floptical drives can read and write standard 720K-byte and 1.44M-byte disks but also give you 15 times the storage and three times the performance when used with the Floptical media.

I've had an external Iomega Floptical drive connected to my PC for two months now, and it delivers on its promises. Performance is good enough that you could conceivably run programs off the drive. And I can back up an entire 120M-byte hard disk on six floppies. The payoff comes for users with large image or multimedia files that can't be squeezed onto a conventional floppy.

But there are drawbacks. At $350, the drive costs at least five times more than a conventional floppy unit. Disks cost about $20. The bigger problem is what I call the Picturephone syndrome: The technology is only useful if a lot of other people have it. And Floptical is just a blip on the chart today.

Iomega seems prepared to lose money on its Floptical drives for some time in hopes that growth — when it comes — will be explosive. The company this week will introduce versions of the drive that plug into SCSI and parallel ports, making it easier to install and move around. And Iomega wants to push the prices of the drives and the media down as far as possible.

But that will come with volume, and there isn't much of that in the Floptical market today.

Gillin is *Computerworld*'s executive editor. His MCI Mail address is 575-4120.

HELP LINE

IBM OS/2

This is another installment in a series of articles containing questions commonly asked by users and responses from vendors' support lines. This week's focus is on IBM's OS/2.

Q: I've gotten to the point where I run so many programs my swap file fills up, but I don't want to add memory. What can I do to solve this?

A: If you have another partition or drive, you can change the SWAPPATH statement in the CONFIG.SYS file to move the swap file to another drive. Then reboot your system to make the change active. The only limitations are that you cannot put the swap file on a disk or tape drive, nor can it reside on a local-area network drive.

Q: I have an IBM Thinkpad and get an Internal Processing Error when I try to install OS/2.

A: OS/2 was released before the Thinkpad line. There is a file on the reference disk for each IBM machine with a Micro Channel Architecture bus that is specific to each machine. To run OS/2 on machines released between releases of OS/2, perform the following steps:

1) Look on the reference disk or partition on the machine for the BIO file for that specific machine. It will be named something like F8E500.BIO. Each system has its own specific file, so do not copy files from machine to machine.

2) Copy this file to both the install disk and disk 1 of your OS/2 2.0 disks.

3) Use a text editor and edit the file called ABIOS.SYS on the install disk. Add a line at the top and make it the name of the file you just copied. Now save the new ABIOS.SYS.

4) Copy this new ABIOS.SYS to disk 1 as well.

5) Now your system will be all ready to install.

Q: I have programs in my start-up folder as well as ones that are running when I shut down my system. How do I prevent these from starting automatically when I reboot my computer?

A: When you shut down your system with programs running or have placed programs in the start-up folder, they are automatically started when your system reboots. There may be reasons why you want to inhibit this action.

To inhibit this action, you can reboot your system. When you see the desktop animation (looks like an exploding box), press and hold the Ctrl+Shift+F1 keys. Hold the keys for approximately 15 seconds or until the desktop icons appear.

Q: I added in a card to my computer, and now I cannot print.

A: You need to check the IRQ settings of the card added to ensure it is not set to IRQ7 or 5, which are used by LPT1 and 2, respectively.

Q: I received my copy of OS/2 in the 3-in. disk version, but my computer's A drive is 5 inches. What can I do?

A: You have several options. First, you can reconfigure your computer so that the A drive is the 3-in. disk. You may need to switch cables or contact your computer manufacturer to do this. You can also contact the IBM support bulletin board or CompuServe to obtain the special installation program that allows OS/2 to be installed from the B drive.

Q: I've heard there is an OS/2 ServicePak. Should I install it?

A: The basic question is whether you have problems with your system that are important to your use of OS/2 and whether they are fixed by the ServicePak. If so, then you should install the ServicePak. Or if you need the function of the 32-bit graphics engine, you should then install the ServicePak.

Q: I print from my DOS application, but then no other application can print. What can I do?

A: It is likely that your DOS application is accessing the printer port directly and not releasing it. OS/2 will not allow two programs to access a physical port simultaneously. You must close the DOS application to allow other applications to print.

InTouch

CONTINUED FROM PAGE 37

to objects that can only be opened by users who carry the proper "keys."

InTouch consists of a Navigator with which users move through the artificial office environment; an Information Processor that allows users to view and track objects and all the other objects they are linked to; and an Object Base that contains all the objects in the environment.

Baldwin Forrester & Co., a consultancy in Atherton, Calif., has used InTouch to develop work-flow applications for a variety of firms. Ease of use, both at development time and day to day, is one of the biggest advantages of the InTouch system.

Indeed, the entire user documentation for a large project built for the National Association of Realtors in Chicago comprised only 18 pages, and the complete developer documentation is less than 200 pages.

Fast and easy

According to Lloyd Dubroff, senior consultant at Baldwin Forrester, InTouch gives customers a chance to create a work-flow application quickly and efficiently.

However, InTouch may not be for everybody. It requires the customer to buy at least one full copy of Revelation Technologies, Inc.'s Revelation database ($950) as well as runtime copies (about $200) for each workstation because InTouch is built on the Revelation Technologies system.

InTouch costs $5,000 per server and $500 per seat. It runs on 286 and higher processors, though 386 or higher with 4M bytes of memory is recommended, the company said.

HP gets serious about PCs, wins some industry respect

By Michael Fitzgerald

PC used to be an unfamiliar acronym way back when at Hewlett-Packard Co., but HP has changed its perspective since then.

"We're still not a Compaq or an IBM, but we're much better off than we were," said Boris Ellisman, PC product market manager at HP.

The numbers seem to bear him out. HP had 150% unit growth and 88% revenue growth in the torrid second half of last year. Analysts said this put HP at close to $800 million in sales — not enough to make the Top 10 but still close. According to International Data Corp., HP was one of only three vendors ranked between No. 10 and No. 25 to grow last year.

Driving this growth was a new image — one users applauded.

"In the past, they didn't seem to take the PC end of the business seriously," said Dawn Kroll, a technical buyer at Chemical Bank, Inc. "With their new outlook on the PC market, we were able to take them seriously." Kroll said Chemical Bank added HP to its buy list in the fall. HP joined Compaq Computer Corp., Dell Computer Corp. and AST Research, Inc.

Analysts said HP is well-positioned to continue solid growth.

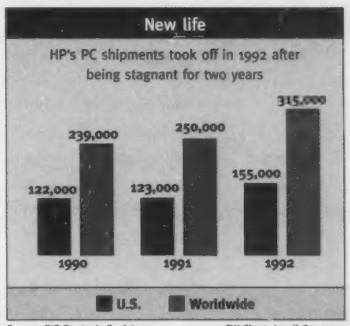
"I guarantee you that HP is going to become a much more important player in the PC industry," said David R. Korus, an analyst at Kidder Peabody & Co.

Korus and others cited HP's aggressive attitude toward pricing, a high-quality product line and an ability to deliver its products in a market wrenched by shortages. HP recently made broad price cuts on its Vectra line of PCs at a time when many vendors were holding prices steady.

In part to increase its image in the market, HP plans to expand its dealer base this year and recently signed on with CompuCom. Ellisman said HP has no plans to move beyond the dealer channel, adding that the vendor plans to aggressively introduce new products this year, with launches planned for each quarter. These will include new lines of PCs to complement its flagship Vectra line.

Sources said HP will also fill a gap in its product line by introducing a notebook product this year, though Ellisman would only comment that "it makes strategic sense for us."

Ellisman said HP's goal is to be a Top 5 vendor in the PC market by the end of 1994.



Source: BIS Strategic Decisions CW Chart: Janell Genovese

Software application packages

Autodesk, Inc. has announced AutoCAD Release 12 for Windows, a fully functional version of AutoCAD for Windows 3.1.

The product offers a variety of features such as the Autodesk Device Interface, the AutoCAD Development System, the AutoCAD Visualization Extension and the AutoCAD SQL Extension.

Microsoft Corp. Windows-based specific features include multiple sessions, performance enhancements, Dynamic Data Exchange, Object Linking and Embedding Server Implementation and Visual Basic 2.0 support, among others.

The product costs $75.

➤*Autodesk*
2320 Marinship Way
Sausalito, Calif. 94965
(415) 332-2344

Dydacomp Development Corp. has introduced Version 5.0 of its Mail Order Manager (MOM) automation program.

According to the company, MOM is a modular, MS-DOS-based system that can be expanded and customized and is compatible with a multiple-user local-area network. Support for well-known network software is provided.

The product uses the dBase Plus file format and has pull-down menus and function keys such as those from Microsoft Corp.'s Windows. MOM's capabilities include prospect management, inventory control, profit analysis, accounting and order processing.

A single station costs $1,195.

➤*Dydacomp Development*
Suite N1
150 River Road
Montville, N.J. 07045
(201) 335-1040

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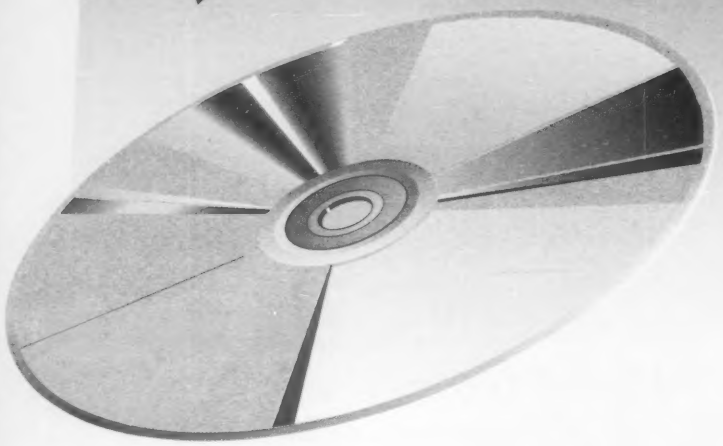

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Workgroup processes

Work flow next rising star?

New activity

Recently, there has been a steady pace of work-flow software introductions, and more are expected. **FileNet Corp.**, one of the granddaddies of work-flow technology, started off the year by launching FolderView, a Microsoft Windows-based program that allows users to create less-structured work-flow applications. Last week, **Beyond, Inc.** said it would begin shipping a tool that helps users create custom forms for the BeyondMail E-mail environment. And this week, **Xsoft**, a division of Xerox Corp, will roll out InConcert, a Unix-based document work-flow management package.

By Rosemary Cafasso

■ With many pilot projects under way and a host of new product offerings recently released, work-flow software has rolled in as the next big wave in workgroup computing.

But while users and analysts said they believe it will deliver productivity boosts, they do not expect work-flow implementation to be quick.

Work-flow software promises to streamline and automate work processes, but it will not be worth much unless the processes are sound. Users and observers said it is key to first study the process to discover how much room for improvement exists. In some cases, it will call for minor fixes, while in others it will require a major overhaul. As a result, the big benefits of work-flow software will often come after a lot of hard work.

"When people think of work flow, they might think there's a pull-down menu for it in [Lotus Development Corp.'s] Notes, but that does not exist," said Kevin Brown, president of the Worldwide Notes Users Group.

Actually, workgroups did not discover work flow. For years, companies such as FileNet Corp. have been selling image management and work-flow management systems. In fact, a 1992 survey by the Delphi Consulting Group, Inc. shows that imaging is still the most commonly used work-flow application. "This technology is mature in some sectors and now it is trying to give birth all over again on a new platform, the PC local-area network platform," said Amy Wohl, president of Wohl Associates.

closer
Work-flow software OK

But Wohl and other analysts expect work-flow technology to flourish in PC LAN and workgroup environments because it is particularly suited for these platforms. A workgroup's success often comes down to the exchange of information among workers.

Currently, there are several work-flow approaches for workgroups, including tool sets to develop in-house applications, such as Workflow Tools software from Action Technologies, Inc. that will be offered as a companion product to Notes; complete packages with a database or document-management foundation, such as Xsoft's InConcert; and enhanced electronic-mail packages, such as Microsoft Corp.'s Mail, which has basic forms-routing capabilities, or Beyond, Inc.'s BeyondMail, which has more sophisticated routing techniques and customization capabilities.

Look out for No. 1

Many vendors will claim their offerings and work-flow approaches can handle a whole spectrum of work-flow needs, from the mundane, administrative operations to the more knowledge-intensive processes. But users seem to be proceeding with their own concerns.

EMC Corp., a disk drive maker, selected Reach Software Corp.'s Workman to beta test, in part because it was the only work-flow package it could find that would work with its Banyan Systems, Inc. Vines platform.

Peter Markell, MIS director at EMC, said the company has high hopes for Workman, although he has not given it a green light just yet. The software fits into the company's overall plans to reduce costs and make operations more efficient. As an example, the software will automatically move documents from one station to the next, so "you know if someone is sitting on something," he added.

The City of Edmonton in Alberta does not have a work-flow strategy per se, but it recently solved a work-flow problem anyway. Using Notes, it built an application that is a "bit of both work flow and workgroup," said Gord Stang, project leader of office automation.

In this case, Stang's group studied the process by which a citizen's request for information traveled from the mayor's office throughout various city departments and then back again. Using Notes, the mayor's office now maintains a requests database, which can be viewed and contributed to by the various departments on-line. The process has eliminated the manual process of moving from department to department.

Resistance factors

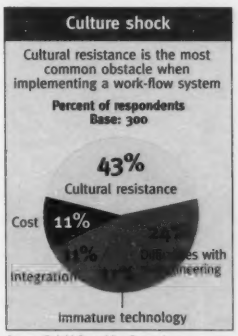
While users piloting work-flow projects have not detected much conflict in the ranks, at least one consultant said managers should be prepared for some resistance.

"There are obstacles with any new introduction to an organization," said Susan Chapdelaine, a consultant at Delphi Consulting Group, which recently completed a survey on work-flow technology. "Our findings have shown that overwhelmingly, they are based on cultural resistance to change."

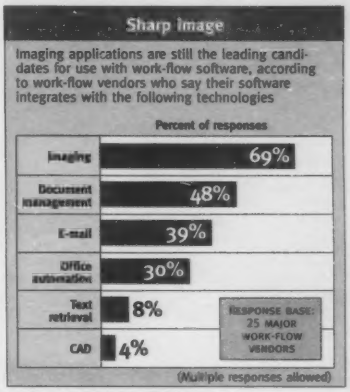
Chuck Riley, a group director and executive vice president at Young & Rubicam, Inc., said his staff has been very positive about a current work-flow pilot project. "They are all very excited to be part of it, and they've really endorsed it," Riley said.

However, Chapdelaine suggested that such a reaction is not always guaranteed. Unlike other automation efforts, work flow can dramatically change the steps and pace of a work process with which a person has grown familiar.

"It effects people on a very basic level — their way of working," Chapdelaine said. "The ability to control your work environment is very important. People need ... some control over their environment or some flexibility."



Source: Delphi Consulting Group, Inc.



Source: Delphi Consulting Group, Inc.

User experience

A different flow

Nicholas Rudd, chief information officer at Young & Rubicam, Inc., a billion-dollar advertising and communications firm in New York, went on the road last year to promote his plans for workgroup technology within the company.

Rudd said he knew the folks at Action Technologies and then he became aware of Lotus' Notes workgroup platform. "It occurred to me that a marriage of the two [products] could prove of interest to us," Rudd said.

In San Francisco, he crossed paths with Chuck Riley, a group director and executive vice president at Young & Rubicam. Rudd found a very receptive audience for his pitch.

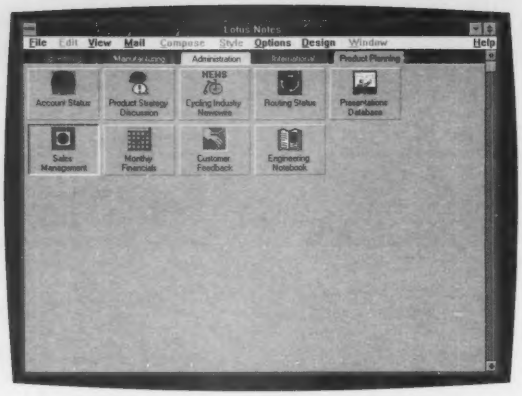
Riley said, "There has been no highly structured or formalized work-flow process" in the San Francisco office he manages.

His staff went to work with Action Technologies staff members to figure out what the processes were and what could be done to make them better. "They did a great deal of interviewing ... and we did a very thorough reanalysis of our work flow and how we go about getting things done," Riley said. "We've already made signficant changes."

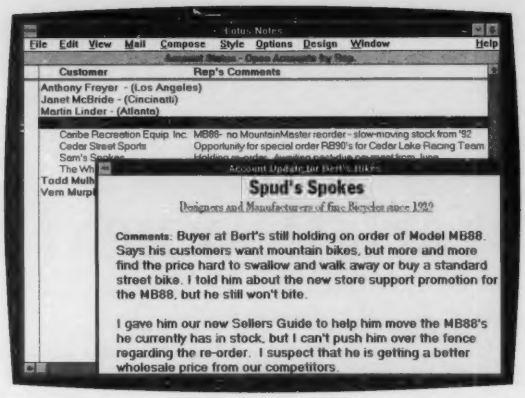
For example, the agency needs to fill out work orders to launch a new job, and that requires inputting information beforehand. "We learned that there was a lot of information that was often missing when we started work on something," Riley said. That, in turn, would result in more work; once the project was under way, a person would have to go back and find the missing pieces.

With the work-flow software, a process is being set up to ensure that all the up-front information be loaded into the work order before the process is allowed to move to the creative department.

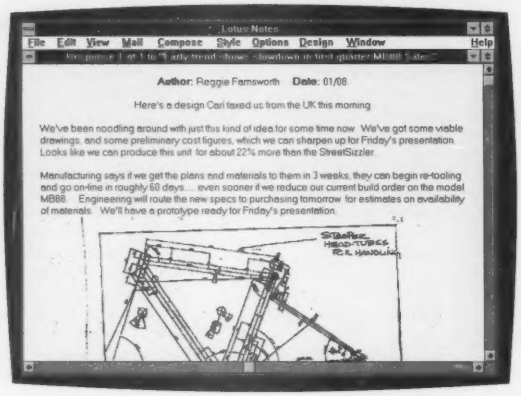
— Rosemary Cafasso



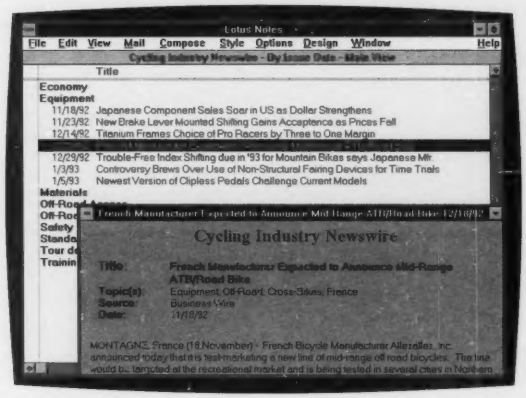
1. This is Michelle's Notes desktop. Each icon represents a different Notes application. She uses these to work with people all over the world including the field sales team, manufacturing, engineering, R&D, key customers and senior management. She regularly scans activities in the field by double clicking on ACCOUNT STATUS.



2. Today, she notices a number of entries regarding a slow-down in closing first quarter reorders for their most popular model, the MountainMaster off-road bike. It seems the market for this high-priced bike is beginning to dry up. This could be a major problem.



5. The next morning she checks into the DISCUSSION database and this time finds an entry from Reggie in R&D. Reggie had also read Jim's message and is responding with a possible solution his people have been playing with. He pastes in an autocad illustration faxed to him from the U.K. using a Notes incoming fax gateway.



6. With a presentation on Friday, Michelle gets down to some quick market research by opening up the CYCLING INDUSTRY NEWS database. An organized source of live industry data, it provides a news report on a French company that has a couple months head start developing a hybrid bike.

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Michelle Cliffington is a product manager for a bicycle manufacturer. She's responsible for all product planning, market research and marketing activities for her product line. Notes helps her shift gears and rush a new product to market.

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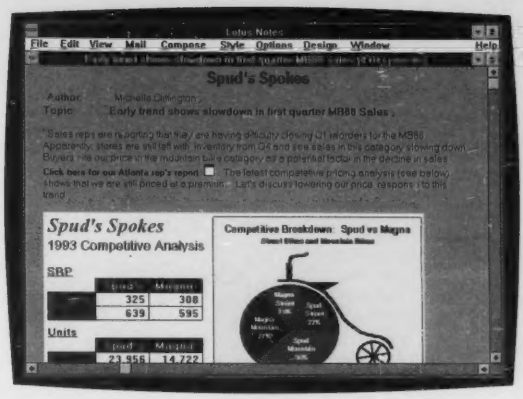
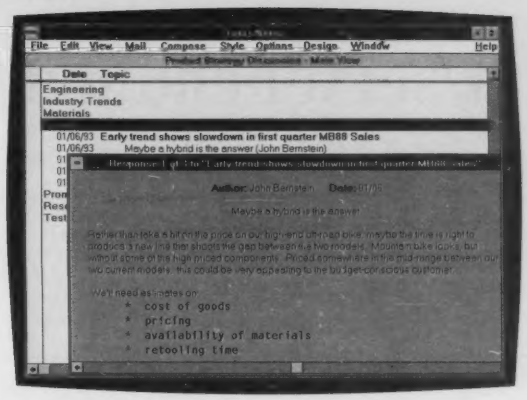
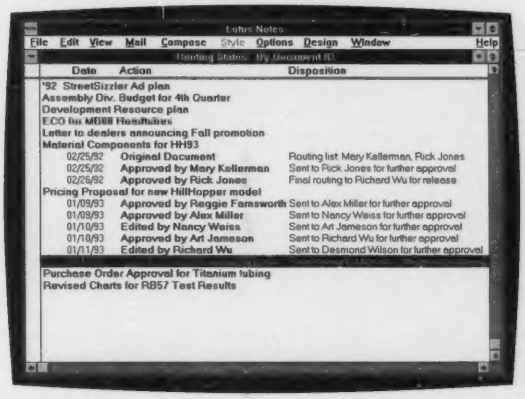


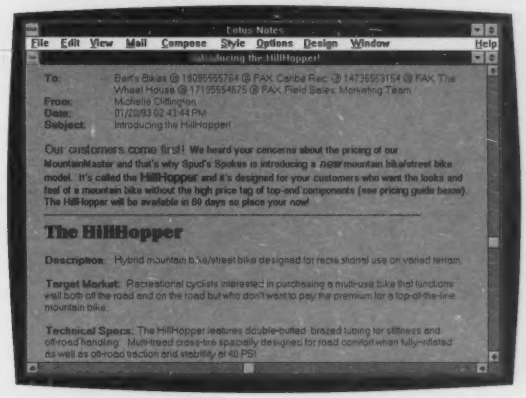
3. She decides to recommend a price-reduction and double clicks into the STRATEGIC PRODUCT DISCUSSION database. This provides an organization-wide forum to discuss issues and brainstorm solutions. She links the report from the Atlanta rep directly into her Notes document. Then she uses DDE to embed some 1-2-3® charts into her document as well.



4. Later in the day she re-enters the DISCUSSION database looking for responses. Her boss, John, has logged on from his hotel room in San Francisco. Rather than cut the margin, he suggests she explore the feasibility of adding a mid-priced bike to their line. He wants an initial presentation for Friday.



7. A few days after routing her proposal to the product team, she wants to find out where it stands within the organization. She opens the ROUTING STATUS application to find that it has worked its way through the organization to Desmond, the senior decision-maker, and has been finally approved. So she's on her way.



8. Michelle closes the loop by communicating the news to their customers. Double clicking into the CUSTOMER FEEDBACK database, she faxes a memo directly from Notes to all retailers. In it she explains that the company has heard their problems and responded with the Hill Hopper. And with delivery in 60 days, they can order now.

can respond with h Michelle shift gears.

effortlessly people use Notes to respond and move the project forward.

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Client/server challenge

Networking issues remain for daily newspaper

By Thomas Hoffman
SAN DIEGO

ON SITE

The San Diego Union-Tribune
San Diego

Challenge: To solve network bandwidth issues in order to add new applications to its recently installed editorial system.

Technology: Microsoft's LAN Manager, MS-DOS 5.0, Windows 3.1, System Integrators' software, Ethernet LANs, Tandem hardware and NEC PCs.

Results: The newspaper is hoping to resolve bandwidth issues so text and photographic images can be distributed more easily across the network.

During the past year, *The San Diego Union-Tribune* completed an overhaul of its editorial systems environment. Although the new client/server platform offers substantial productivity gains over the predecessor system, the daily newspaper is still facing some thorny networking issues.

Union-Tribune executives said they are hoping to resolve bandwidth problems resulting from the use of Microsoft Corp.'s LAN Manager 2.1 over the NetBIOS protocol.

The *Union-Tribune*, which reaches 387,000 readers in the greater San Diego area, replaced seven aging Digital Equipment Corp. PDP-11 minicomputers with a network of more than 300 Intel Corp. 1486-based NEC Corp. PCs. The editorial PCs — equipped with co-adapter cards — run a proprietary software package from Sacramento, Calif.-based integrator System Integrators, Inc. as well as Microsoft's MS-DOS 5.0 and Windows 3.1 applications. Editors and reporters are then able to toggle between operating systems.

The PCs are linked to a Tandem Computers, Inc. R/4000 reduced instruction set computing-based fault-tolerant machine. Although the newspaper successfully linked its users over a Fiber Distributed Data Interface (FDDI) Ethernet backbone, the group is still working to settle some pressing network bandwidth issues, according to David Knight, the *Union-Tribune*'s computer systems director.

The newspaper is using Microsoft's LAN Manager 2.1 to manage the editorial network. However, Knight said the supported NetBIOS protocol gobbles up "inordinate amounts of bandwidth, which is our biggest network issue."

Because NetBIOS is not an internetworking protocol, nodes attached to networks using the protocol do not have internetwork addresses. As a result, network administrators are forced to broadcast messages to everyone on the network when they are contacting another NetBIOS address for the first time.

Knight said he has discussed the problem with Microsoft officials to determine whether the newspaper is managing the network inefficiently or whether it is an internal problem with NetBIOS.

Knight said he has considered replacing the NetBIOS protocol with Transmission Control Protocol/Internet Protocol (TCP/IP), but this, too, poses a problem. "TCP/IP over Microsoft's LAN Manager doesn't run as well as NetBIOS," Knight said.

He added that Microsoft has confirmed that its upcoming LAN Manager 2.2 network administrator will offer improved bandwidth capabilities over its predecessor.

Last year, the *Union-Tribune* worked with System Integrators to replace the slow and problematic DEC PDP-11 cluster with the client/server configuration. "The PDP-11s were getting hard to maintain, and reliability was a major problem," Knight said.

Up to speed

The paper went to full production with the system last October, and Knight said the new configuration offers five to 50 times faster response in gathering news information than the former DEC PDP-11 word processing environment. As a result, the newspaper's editors and reporters are better equipped to meet their deadlines.

While the four-processor Tandem system runs the newspaper's editorial production, a DEC VAX powers the paper's library system in nearby La Jolla, Calif.

Reporters working on the editorial system are able to access text from past articles stored on the VAX using Intel 80386-based multiple local-area network attachment devices and Ascom Timeplex bridge routers. Client PCs are locally connected onto an FDDI ring. Terminal emulation is conducted via TCP/IP. Dual T-1 links were added to the La Jolla site for redundancy purposes.

David Knight: *'The PDP-11s were getting hard to maintain'*

If the newspaper is able to solve its bandwidth problems, Knight said, he would like to add a distributed database to the network. Such a system would eventually house thousands of pictures taken by staff photographers. More importantly, the on-line database would allow the paper's caption writers to access photos instantly on their PCs, a feature that is currently unavailable.

The *Union-Tribune* currently receives digitized photographs over a proprietary Associated Press file server. Images are routed to Apple Computer, Inc. Macintosh PCs using a DEC VAX server. However, that network cannot feed photographic images to the newspaper's caption writers.

Knight said he expects to identify prospective vendors for the photographic database system this year and receive approved funding for the project in 1994.

In Brief

Building blocks

FileNet Corp. will port its document imaging and WorkFlo software to **Hewlett-Packard Co.**'s Precision Architecture-RISC-based HP 3000 and HP 9000 Unix systems and servers by year's end.

Novell giveaway

Novell, Inc. has launched a promotion intended to boost sales of its Network Navigator electronic software distribution product. Under the promotion, resellers who attend Novell seminars on Network Navigator will receive a free 10-user copy of Network Navigato and coupons for free five-user versions that can be used by customers to upgrade their Novell NetWare local-area network operating systems to NetWare v3.11.

Self-help networking

Coactive Computing Corp. in Belmont, Calif., has announced a new family of do-it-yourself networking products designed for small offices. The products, called Coactive Connectors for **Microsoft Corp.**'s Windows, MS-DOS and **Apple Computer, Inc.**'s Macintosh, consist of hardware, software and cables required to connect PCs through the parallel port. Coactive Connectors will be priced at $129 for DOS and Windows versions and $29 for the Macintosh version. The products will begin shipping in April and will be available from distributors, large computer stores and mail-order catalogs.

Added security

Secure Computing Corp. in St. Paul, Minn., won a $22.3 million contract to develop computer security products for the U.S. Department of Defense Secure Network Server program.

Symphony of choices

Crescendo Communications is shipping Fiber Distributed Data Interface (FDDI)-over-copper adapter cards for three new environments: **Sun Microsystems, Inc.**'s Solaris, HP's Apollo 700 series and Novell's NetWare. The cards allow users to run the high-bandwidth FDDI protocol over unshielded twisted-pair copper wiring. Prices are $2,395, $1,995 and $995, respectively.

LANalyzer rights

Novell has announced a licensing and technology agreement with Bloomington, Minn.-based **Network Communications Corp.** (NCC) whereby NCC will acquire exclusive rights to develop, market and support the hardware-based version of Novell's LANalyzer network analyzer. The agreement includes the hardware-based LANalyzer only; Novell will continue to develop and market its software-only LANalyzer for Windows product.

XDB-Server for OS/2 2.0 debuts

By Jean S. Bozman
LAUREL, MD.

XDB Systems, Inc. has shipped a 32-bit desktop version of IBM's DB2 relational database management system for IBM's OS/2 2.0 operating system.

The new XDB-Server for OS/2 2.0 will be sold to two audiences: corporate developers that are downsizing DB2 mainframe applications to PC local-area networks and users who perform mainframe programming on the desktop.

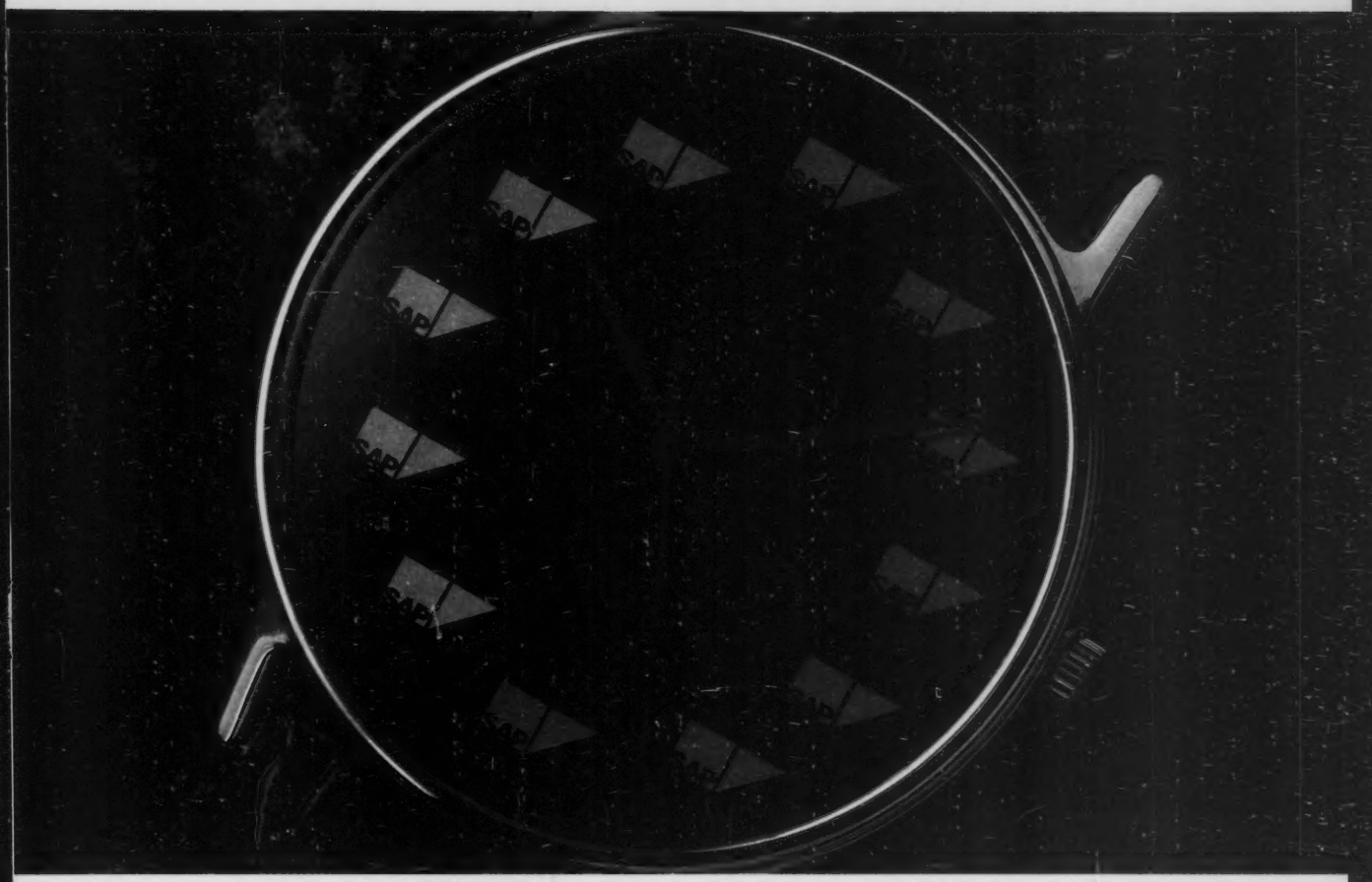
"We provide all the functions of mainframe DB2," said XDB Chief Executive Officer and President Bing Yao. "The application will see the same behavior on our system. Our job is to downsize the platform, then make it run every bit like a mainframe."

The 32-bit OS/2 server supports more main memory than the previous 16-bit version, which lets users hold many temporary database files in main memory, XDB executives said. Users can extract database tables from a mainframe DB2 system and download them to the XDB-Server, Yao said.

The XDB-Server for OS/2 2.0 supports all the functions in XDB Version 3.0. It uses the same naming conventions, security features and storage structure as mainframe-based DB2. But XDB's client/server development tool also supports multiuser access and connectivity with workstations running IBM's PC-DOS and OS/2, Microsoft Corp.'s Windows and Unix. Client workstations can connect with more than one XDB server, if needed, XDB said.

Pricing for the OS/2 system ranges from $2,000 to $30,000, depending on the number of users accessing it, Yao said. Users will need a PC with an Intel Corp. 80386 to 1486 microprocessor, a minimum of 6M bytes of main memory and a copy of IBM OS/2 2.0. Earlier versions of XDB-Server for 16-bit OS/2 were priced at $1,500 for a single-user copy. Yao said some 30,000 copies of the company's flagship XDB Workbench product are installed worldwide.

Client/server:



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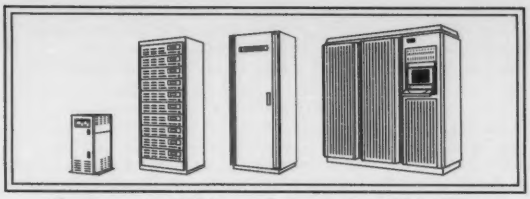

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Electronic mail

CE Software Holdings, Inc. has announced that it will ship Version 2.6 of QuickMail by March 26.

QuickMail 2.6 is an Apple Computer, Inc. Macintosh server-based electronic-mail software product.

Version 2.6 provides client/server software, forms creation, remote access and enhanced administration tools. Gateways, mail filing and real-time, on-screen conferencing are also included in the system.

Enhancements have been made to QuickMail's Network Status Display, and the product works with AppleShare 3.0 and 3.0.1 and System 7 file sharing, the company reported.

A 10-user pack for QuickMail 2.6 costs $649.

➤ *CE Software Holdings*
1801 Industrial Circle
West Des Moines, Iowa 50265
(515) 224-1995

Casady & Greene, Inc. has released Snap Mail, an electronic-mail and messaging system.

Snap Mail was designed for the Apple Computer, Inc. Macintosh and offers automatic installation with supported features, including file enclosures, encryption, mail reply and forwarding, dated return receipts and forms.

Icons can be created and designed by users, and temporary alerts are available. System 6.02 can communicate with System 7.1 users. Snap Mail's only requirement is an AppleTalk network.

Five-packs costs $125, 10-packs are $200, and 50-packs are available for $900.

➤ *Casady & Greene*
22734 Portola Drive
Salinas, Calif. 93908
(408) 484-9228

Frontier Technologies Corp. has announced Super-TCP for Windows, an electronic-mail application.

The product offers full Multipurpose Internet Mail Extension that enables users to send and receive multimedia/multipart messages across Transmission Control Protocol/Internet Protocol networks, the company reported.

Adobe Systems, Inc. PostScript images, database files, graphic files, word processor files, spreadsheets and audio and digital video messages can now be sent and received by Microsoft Corp. Windows users.

Super-TCP for Windows costs $495.

➤ *Frontier Technologies*
10201 N. Port Washington Road
Mequon, Wis. 53092
(414) 241-4555

Applications

Microdyne Corp. has announced 3270 Workstation for Windows emulation software.

The packages include full-featured, icon-based 3270 emulators created for the Microsoft Corp. Windows operating environment. They offer icons, extensive graphics and point-and-click functions and were designed to simplify the most complex 3270 operations, the company reported.

The 3270 Workstation for Windows is available in two versions: 3270 Cut Workstation for Windows and 3270 Multi Workstation for Windows.

According to the company, the 3270 Cut permits a single mainframe session access across coaxial attachments, while the 3270 Multi provides for up to 26 mainframe sessions across industry-standard Token Ring and Synchronous Data Link Control attachments.

Pricing begins at $350.

➤ *Microdyne*
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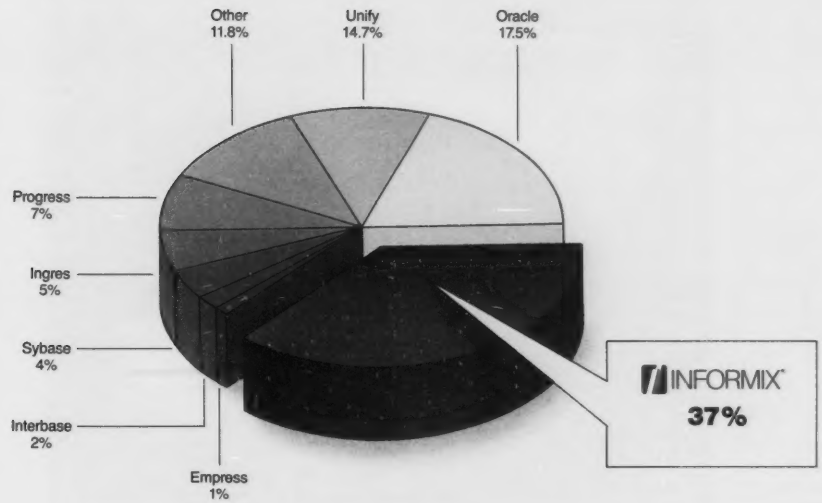

Worldwide UNIX Relational Database Software License Shipments, 1991
Source: International Data Corporation, 1992

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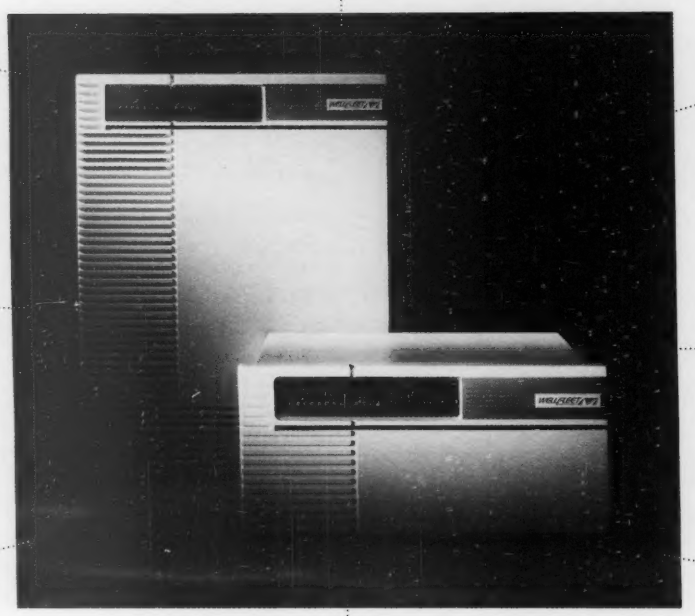

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Smart hub vendors flock to switching

By Joanie M. Wexler

■ While Ungermann-Bass, Inc. recently became the first hub vendor to slap a ship date on its "ATM-like" LAN-per-port switching module [CW, Feb. 22], several of the company's competitors have indicated they also will blend such capabilities into their gear.

"LAN switching," which is becoming the rage among hub suppliers, gives individual computer users their own private local-area network. This increases and guarantees bandwidth to each node. Because bandwidth is guaranteed, users can run delay-sensitive traffic, such as voice and video, on today's LANs.

"We will see similar announcements from all the hub vendors within the next 12 months," said Dave Passmore, vice president and service director of local-area communications at Gartner Group, Inc., a Stamford, Conn.-based research and consulting firm.

Bytex Corp., for example, plans to offer an Ethernet switching module in 1994 prior to supporting Asynchronous Transfer Mode (ATM) in the 1995 time frame, according to William S. Starner, corporate vice president of product marketing.

ATM is a higher speed version of the LAN switching concept that brings several other capabilities, such as mixing and matching node speeds, to the table.

Off list

Forty percent of the companies listed in the Fortune 500 15 years ago are no longer listed today, according to consulting firm DMR Group, Inc. To stay on the list, companies must employ technologies such as LAN switching and virtual LAN reconfiguration coming to smart hubs to break down traditional hierarchical walls and dynamically set up teams to work together across the enterprise, DMR Group said.

Similar murmurings about LAN switching and ATM migration have come from such companies as hub market leader Cabletron Systems, Inc., Synoptics Communications, Inc. — through an alliance with Ethernet switching company Kalpana, Inc. — and Chipcom Corp.

On the bandwagon

In addition, according to analysts, Synoptics plans to roll out a stand-alone ATM switch at the Interop trade show in Washington, D.C., early next month. If the switch materializes, Synoptics would join Adaptive Corp. and Fore Systems, Inc. in that market.

Bytex also announced earlier this month that its network management software is available on Hewlett-Packard Co.'s OpenView platform. Bytex and Chipcom, until the UB development, had a technology advantage in network management, in that their "per-port switching" capabilities allow a limited set of virtual LAN configuration capabilities. These capabilities were part of the UB announcement and are inherent in ATM technology.

These management features allow network administrators sitting at a workstation to move users and devices such as printers from one workgroup to another through point-and-click technology, rather than physically rewiring at the cabling closet.

Bytex's management software already runs on Sun Microsystems, Inc. SunNet Manager, IBM's NetView 6000 and other Unix-based platforms.

The OpenView compatibility "is a very smart move because that's a very accepted platform," said Charlie Robbins, director of communications research at Aberdeen Group, a consulting firm in Boston. Not supporting that OpenView "might have locked them out of some accounts."

By year's end

Bytex said it plans to ship new automated network management applications before year's end for its hub to lower customers' LAN operations costs. The applications include programming the network to automatically reconfigure at certain times of the day or when it hits specified traffic levels and an automatic departmental billback system.

Future directions include incorporating expert system technology into the platform, Starner said.

Simultaneously with its OpenView announcement, Bytex said it will ship a $4,995 low-end hub for lightly populated branch offices (12 to 24 ports) next month with a limited degree of modularity, and that a 16-port nonmodular version would likely emerge by the end of the year.

Manufacturing

Ford, Mazda put car quality on-line

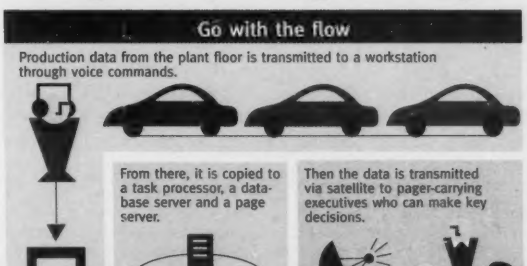
By Lynda Radosevich
FLAT ROCK, MICH.

The word "kaizen" is Japanese for a business philosophy of constant improvement. You can find the word written on bulletin boards and the concept depicted in murals on the manufacturing floor at Auto Alliance International, Inc. (AAI), the venture between Mazda Motor Corp. and Ford Motor Co. that produces the Ford Probe, Mazda 626 and Mazda MX-6.

To help implement kaizen, the alliance has launched a quality information management system (QIMS). The system instantly delivers information collected by inspectors on the plant floor about problems that prevent cars from shipping.

The information is compiled every six minutes and made available to managers, engineers, analysts and executives via nodes on a local-area network.

Although this was a big improvement over previous paper and pencil systems, the company has gone one step further and found a way to get the data into the hands of 70 managers and executives wherever they are, using pagers.



"There are some people that say, 'You aren't going to change manufacturing or make an improvement with just the data.' That is correct," said Kasey Kasemodel, an analyst at Mazda Systems Service of North America, the group in charge of developing QIMS. "But you also aren't going to make any changes unless you have the information, so this is just one step in being able to improve the quality of the vehicles."

Immediate info

Before QIMS, it took roughly 30 hours for data collected on the production line to reach decision-makers who could address problems, Kasemodel said. In addition, it was difficult or impossible to study the history of problems because the reports were rigidly formatted and distributed on paper. Now, information is available almost immediately, and custom reports can be generated in minutes.

While the impact of getting data faster is hard to measure precisely, response time to problems "has definitely improved," according to Joe Silvestri, senior staff engineer at AAI.

In addition, the company saves administrative and personnel costs because fewer people are needed to collect and distribute the data.

The half-million-dollar investment in hardware, software and programming hours will pay back in less than eight months, Silvestri estimated.

Inspectors check every vehicle and record problems on a ticket that accompanies the vehicles to the end of the production line. There, final inspectors speak into headsets equipped with Task Man-

Ford, Mazda, *page 52*

ON SITE

Auto Alliance International, Inc.
Flat Rock, Mich.

Challenge: To collect data on problems with cars at the end of the manufacturing line and make it available as soon as possible.

Objective: To increase number of cars that go straight through manufacturing line without any problems.

Technology: Voice recognition software, radio transmissions, Token Ring networks, client/server database, pagers.

IBM, Raylan offspring puts Token Ring users on fiber

By Joanie M. Wexler

IBM and Raylan Corp. recently served up a device that allows Token Ring nodes cabled through IBM's 8230 smart hub to communicate across optical fiber.

The 8230 Fiber Optic Lobe Access Module will likely appeal initially to niche Token Ring shops, such as interference-prone manufacturing floors, that are cabling large buildings and campuses, users and analysts said. The reason is that running Token Ring over fiber via the module alleviates the distance limitations of copper wiring.

This allows users to conserve real estate by consolidating wiring closets and to eliminate investments in copper-to-fiber conversion gear previously needed to achieve longer hub-to-desktop distances. Token Rings of 16M bit/sec. speeds can run across fiber up to 1,000 meters, while copper wiring supports them for just 100 or 145 meters, depending on wire grade.

IBM co-developed the module, which lists for about $1,500 and is scheduled to ship next month, with fiber networking company Raylan in Menlo Park, Calif. Because fiber cable costs have dropped to about even with copper, Token Ring sites interested in the security and upgrade potential of fiber can install the medium pervasively, explained Bob Love, senior engineer of IBM's Networking Systems group in Research Triangle Park, N.C.

For example, the Mid-Hudson Regional Computer Center for the Alstair County Board of Cooperative Educational Services in New York, an 8230 shop, said the fiber module would allow them to consolidate wiring closets and save space and money on additional hubs and wiring in the schools it supports.

"Plus, [having all the intelligence centralized into fewer closets] makes it easier to manage the whole thing," said Kevin Conero, computer coordinator.

Good reason

The four school districts supported by the center are motivated to move to a fiber infrastructure because "the big thing in education is multimedia and interactive voice and data," Conero said. "Fiber [bandwidth] will hold us over for many years to come," while copper will be outdated more quickly, he said.

Previously, Conero was limited to running Token Ring over fiber in a backbone configuration — not to the desktop — because he could not afford the $1,500 price tag of each IBM 8220 copper-to-fiber converter needed to wire every node, he said.

Most hub vendors do not offer fiber modules for their gear, according to Aberdeen Group, a consultancy in Boston.

Part of the reason could be that the standard for running Token Ring local-area networks over fiber is not yet complete. However, it is in final stages of approval, said D'Arcy Roche, president of Raylan.

All in one

In other Token Ring hub news, Racal-Datacom, Inc. said last week it has crammed all the functions for connecting and managing a 10-user Token Ring network onto one $2,995 module that snaps into its Internext smart wiring hub.

The goal of consolidating Simple Network Management Protocol management and Token Ring connectivity onto a single module, company executives said, is to accommodate IBM-centric customers looking to move to Token Ring local-area networking in branches without breaking the corporate budget.

Blending functions onto one module, explained Scott Wieder, Racal's director of product marketing, means users make fewer card investments and have more slots free to expand the network.

Racal also rolled out a second $1,995 card that connects up to 16 additional nodes that can be managed under the chassis umbrella. The design reportedly allows the hub to support more than 200 Token Ring users in an 11-inch-high space. — *Joanie M. Wexler*

IBM unveils entry-level NetView

IBM recently announced an entry-level version of NetView/6000, which is said to be a third of the price of the original RISC System/6000-based system for managing Unix and Transmission Control Protocol/Internet Protocol networks [CW, Feb. 1].

The company also announced Trouble Ticket/6000, a set of integrated applications for tracking and coordinating responses to network problems from the first alert through resolution.

The package will be able to exchange trouble tickets with IBM's Info Man, a host-based program for keeping track of problems. This will enable NetView/6000 users managing local networks to coordinate problem resolution with network control center operators on IBM's NetView "without a lot of phone calls," IBM spokesman Bill Warner said.

Priced at $12,500, Trouble Ticket/6000 is available now for NetView/6000 Version 1. It includes an Ingres database access feature.

IBM also announced that it now has 35 members in its NetView/6000 Association of vendors who have committed to delivering applications for its network management system.

➤*IBM Networking Systems*
P.O. Box 12195
Dept. 83-A, Building 002
Research Triangle Park, N.C. 27709
(800) 426-2255

Micro-to-host

Wall Data, Inc. has released Rumba for VAX software.

Rumba for the VAX is part of the company's PC-to-host connectivity product line and offers Microsoft Corp. Windows users the ability to fully and transparently connect to Digital Equipment Corp.'s midrange and mainframe computers, Wall Data said.

Features include a history buffer, split-screen file transfers, Wall Data TrueType VT terminal fonts and an on-screen VT terminal keyboard. Intelligent macros plus an Emulation High Level Language Application Programming Interface are also provided. Hot links, color remapping, context-sensitive Help, keyboard remapping and Dynamic Data Exchange are standard Rumba features.

Rumba for the VAX costs $295 for a single-user license.

➤*Wall Data*
17769 Northeast 78th Place
Redmond, Wash. 98052
(206) 883-4777

Systems Network Architecture

Teubner & Associates, Inc. has announced A-Net and the A-Net Login Server for IBM's AIX.

According to the company, the products provide IBM block-mode 3270 terminal users access to applictions on the RISC System/6000. A variety of full-screen AIX applications can be accessed by 3270 users via A-Net's industry standard ASCII terminal emulations including Digital Equipment Corp.'s DEC VT200. A Systems Network Architecture (SNA) connection between the Enterprise System host and the RS/6000 is a requirement; it eliminates the need for terminals, protocols or non-SNA networks.

A-Net prices range from $10,000 to $33,000. Prices for A-Net Login Server for AIX range from $1,500 to $12,000.

➤*Teubner & Associates*
623 S. Main St.
Stillwater, Okla. 74074
(405) 624-2254

Ford, Mazda

CONTINUED FROM PAGE 51

ager voice recognition software from Vocollect, Inc.

The inspectors have a 600-word vocabulary to describe what is wrong with the vehicle. Every time a car is completed, the information is transmitted by radio frequency to a workstation 70 feet away. The station is connected to a Token Ring network via fiber cabling that runs to the ceiling of the production area and continues on to a task processor in a computer room.

Mazda Systems Service installed fiber throughout the production building when it moved there in December 1991 because "in addition to fiber's impervious nature to disturbances, we now have capacity from now until ... there is no future that fiber could not accommodate," Kasemodel said.

At intervals of one minute, an Intel Corp. 1486-based task processor on the network establishes a peer-to-peer connection with the workstation on the plant floor, uploads the data, generates reports and creates database files.

"The reason we didn't send the data directly to the file server is that if we had a problem with the file server," it would disrupt data collection on the plant floor. By sending data to the workstation, "if the network dies, the inspectors can still collect data," Kasemodel said.

What's the connection?

A database server lifts the data from the task processer, and users throughout the network query the database and generate reports using a Microsoft Corp. Excel spreadsheet program. The users are connected to three 16M bit/sec. Token Ring networks with adapter cards from Madge Networks, Inc. The three rings are connected using Synoptics Communications, Inc. hubs.

Mazda Systems Service used Excel to develop the client/server report system because Excel is the AAI standard spreadsheet and users are comfortable with the software. Using the Excel program, users can click on a certain field, such as Top 20 concerns, and generate a custom report in a matter of minutes.

Writing the complex Excel macro was the project's biggest challenge, Kasemodel said.

Meanwhile, condensed data, such as the number of cars that come through the system, is sent every two hours via modem from a page server to a host computer and then is broadcast to roughly 70 unit leaders, managers and executives carrying pagers from PacTel Corp.

"The way we are disseminating information is changing how people look at data," Kasemodel said. "They don't have to seek out a PC; the data comes to them, and that keeps people focused on quality."

Plant facts

AAI is a 50/50 joint venture between Mazda and Ford.

It produces 240,000 vehicles per year.

Each car travels 13 miles in the course of production.

After the metal pieces of the car are cut out, it takes about 32 hours to produce one car.

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InterBase: Serving two worlds

Borland positions DBMS to please two distinct groups

By Jean S. Bozman

As Borland International, Inc. positions its InterBase database management system, it must deal with an InterBase user community divided into two camps: longtime users who turned to the InterBase relational database engine in the late 1980s to downsize their minicomputer applications and a new group of PC local-area network users who want to upsize from desktop databases to an industrial-strength database server.

The needs of the two groups are quite different, users at 10 InterBase sites said during recent interviews. Many of those who chose InterBase for its ability to store images and geometric data types bought the product from InterBase Software Corp. and rely on their own resources for database maintenance. Often found at aerospace companies such as Lockheed Corp. and The Boeing Co., they tend to run InterBase on networked Unix workstations or traditional minicomputers.

A newer group of users tends to purchase InterBase as a robust database for client/server applications. They are buying it directly from Borland, which acquired InterBase when it bought Ashton-Tate Corp. in 1991. Many of them accept Borland's stated strategy for InterBase as a hub for Borland's Paradox and dBase desktop databases and Integrated Database Application Programming Interface middleware. The combination package appeals to small information systems shops moving into relational databases for the first time, users said.

InterBase, *page 57*

Don't bet the farm on it

InterBase users are often proud of their self-reliance. Many learned to troubleshoot their own problems and invented workarounds during the last six years when their product passed from start-up InterBase Software to Ashton-Tate to Borland.

But longtime users seem content to do their own maintenance. "The only time you really hear from an InterBase customer is when you first sell the thing to him," said Donald De Palma, co-founder of InterBase and now a senior analyst at Forrester Research, Inc. in Cambridge, Mass. "They have a package of tools that lets them build whatever they want." These tools include precompilers for C, Fortran, Cobol, Ada, Pascal and PL/1.

Aficionados like the long list of InterBase bells and whistles, but newcomers may not like the degree of technical expertise required to build new applications. InterBase users still do not have many client/server tools, and they have few Microsoft Corp. Windows development tools.

But that is about to change. In six months, Borland will provide a SQL Link product to tie InterBase to its new Paradox for Windows object-oriented desktop database tool set. Industry analysts said Uniface, Inc. in Alameda, Calif., is also working on an InterBase driver for its database tool kit. Borland promises that its IDAPI middleware will connect most PC front-end tools to InterBase.

Still, InterBase is likely to be low on the porting list for many third-party tool kit makers. That is just a matter of market share: Industry analysts estimated there are roughly 10,000 InterBase licenses worldwide, although Borland claimed the installed base is 20,000.

"InterBase was a fine little company," said Chris LeTocq, a senior research analyst at Computer Intelligence/Infocorp in Santa Clara, Calif. "But some will question whether the InterBase product is big enough to bet their future on it."

Big iron bills drive Armco to outsource

By Mark Halper
MIDDLETOWN, OHIO

To an information systems director considering outsourcing a data center, a prospective outsourcer's pitch can sound like the old line, "Heads I win, tails you lose."

Such may have been the case at Armco Steel Co. as it began weighing outsourcing options last July, a process that culminated last month in a 10-year contract with IBM's Integrated Systems Solutions Corp. (ISSC) subsidiary.

George Homand *says outsourcing will let Armco focus on manufacturing steel*

Armco and ISSC are now enjoying the honeymoon, following a marriage that George Homand, director of information resources management at Armco, said "will allow us to concentrate on our core business of making steel." Armco anticipates the arrangement will save $100 million in IS costs. Unlike other outsourcing contracts, the Armco/ISSC deal does not provide Armco with an up-front cash infusion, according to Mark Essig, vice president of employee relations at Armco.

Driven by upgrade costs

There is a touch of irony in the company's turning to IBM's outsourcing unit because the compelling economic factors in Armco's decision, Homand said, include upgrade fees that Armco had been paying to IBM.

"If you have a computer that's 60 MIPS and you need to go to 65, but the next computer up is 100, you have to go for it," Homand observed.

Such was the case last June, when Armco upgraded from an IBM 3090 mainframe to an IBM Enterprise System/9000 Model 740, a move that entailed buying a lot of excess capacity, Homand said.

In choosing to outsource, Armco simply opted for a lower cost computing solution from its supplier — one that took a lot of IS worries off its industrial mind, full of core material such as ingots, furnaces, rolling machines and tariffs.

In headier days, Armco may have made do with what some erstwhile outsourcers have tried: using its data center to bring in revenue by selling excess capacity. However, some of those companies found that approach was easier said than done.

Furthermore, Armco's financial condition — the company lost $250 million in 1991 on sales of $1.5 billion and anticipates a loss for the year ended Dec. 31 — has it looking for ways to save money and does not create an environment for business diversification.

But the power of excess computing was not lost on ISSC, which, having outsourcing as its raison d'etre, plans to use the excess capacity in Middletown to process for other ISSC customers.

Armco, *page 57*

ES/9000s gathering speed at high end

IBM's Enterprise System/9000 mainframe family has been slow to take hold, according to a new survey by Computer Intelligence in La Jolla, Calif. By mid-1992, almost two years after its introduction, there were only about 3,600 ES/9000s installed.

Many of the new mainframes in place — 47% of the installed base — are low-end, rack-mounted models. The air-frame models account for 36% of the ES/9000s installed, with the water-cooled high end making up about 17% of the base.

In 1992, about 55% of the 9221 models — the rack-mounted and air-cooled machines — went in to replace older Model 4300 mainframes. An additional 23% of those systems replaced by 9221s were 9370s. However, of all the 4300s and 9370s replaced in 1992, only 11% and 50% of the users, respectively, migrated to an ES/9000, with the rest going to other platforms, Computer Intelligence said.

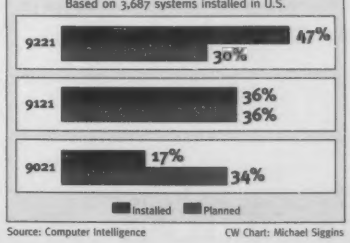
Of the water-cooled ES/9000 models installed in 1992, Computer Intelligence said, 45% replaced Model 4300 mainframes. And 29% of the systems replaced by the ES/9000 models were water-cooled 30XX systems. Still, only 19% of the 4381s replaced in 1992 were succeeded by a 9121.

On the other hand, according to Computer Intelligence, future purchase plans are pretty well divided among the three ES/9000 processor groups, with large-horsepower boxes the primary beneficiaries. "IBM's business will be at the high end," said Karen Landis, an analyst at Computer Intelligence. "It is where the most interesting announcements are, and it is what IBM is really concentrating on."

—*Johanna Ambrosio*

Bottom up

The low-end models dominate the ES/9000's installed base, although the higher end 9021 models show strength in terms of planned purchases



Source: Computer Intelligence

CW Chart: Michael Siggins

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- Evolving Network Architecture
- The Services Industry Gold Rush
- Rightsizing War Stories: Lessons for Success

Track 2 - Personal Systems

- Tomorrow's Trends in the PC Systems Market
- PC Software Confronts the Enterprise
- Messaging and Advanced Group Applications
- Channel Management in the 90s

Track 3 - Winning the Midrange Wars

- Rightsizing for Technical Computing
- Are Midrange Systems Commodities?: A Survival Guide
- As the Unix Battles Rage, the War with NT Looms
- Midrange Contradictions

Track 4 - Networking

- Customer Directions: Managing Networking Investments
- Network Applications: Mobile Data Networks Add Another Dimension
- Local Area Networks: The Platform for Distributed Processing
- The Access Boundary: Understanding the Edge of Network Intelligence

Track 5 - Global Markets

- The New Europe: Opportunities and Obstacles for IT
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Armco

CONTINUED FROM PAGE 55

The caveat, Homand noted, is that the steel company "has the right to agree to who they bring in."

If ISSC were to win a contract with competitor LTV Corp. across the state in Cleveland, for instance, Armco might block ISSC from bringing LTV into the Armco center.

Meanwhile, Homand is looking forward to gaining benefits above and beyond cost savings and core business concentration from the ISSC contract.

"This gives us bench strength," Homand said, noting that ISSC can draw on greater numbers of experts in any technological field than Armco could.

"In today's environment, if we need additional support in, say, EDI, we only have a few people knowledgeable in it, and we wouldn't be able to hire a specialist," he said.

Homand is looking forward to gaining benefits above and beyond cost savings from the ISSC contract.

As for the cost savings, a portion will come out of computer leases that ISSC absorbs. The outsourcing company is taking over leases for IBM equipment used for payroll, finance and inventory, as well as for a Prime Computer, Inc. machine.

A separate operation within Armco will continue to operate computers that support manufacturing.

Holding onto its VAX

Armco will continue to operate its own Digital Equipment Corp. VAX 6610, a machine it purchased a year ago that it uses to support its steel rolling scheduling.

Armco had no payments left on the DEC machine and therefore had less incentive to hand it over to ISSC than it had with the leased equipment, Homand said.

ISSC is offering jobs to all 90 IS staff members who survived a round of layoffs last summer. A minority of the 90 will be asked to relocate, Homand said.

The employees are scheduled to transfer by April 1. Homand and Essig will remain at Armco, as will Dick Sunderman, manager of application development, and John Back, senior staff planner. Sunderman and Back will continue to report to Homand, and all three will act as liaisons to ISSC, which will run application development and data processing.

DEC's Polycenter easing integration

By Melinda-Carol Ballou

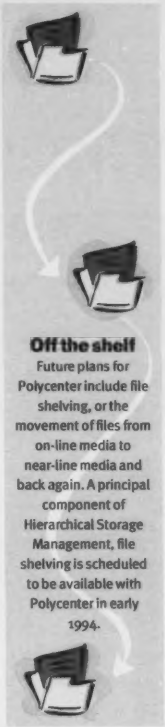
Digital Equipment Corp. improved its new Polycenter network and systems management offerings with the introduction of Polycenter Console Manager Version 1.0 and enhancements to nine other products last month.

The goal of Polycenter is to allow users to integrate applications for all management functions within the Polycenter framework, which now supports the Motif graphical user interface, better execution of scripts and collection of events, DEC officials said.

"We recognize the need to manage the new distributed computing environment, where you have the mainframe end of the business downsizing and the PC LANs upsizing," said Dennis Biedrzycki, Polycenter marketing manager.

Accompanying this release of Polycenter is a console for systems and network management that lets users handle up to 200 systems — from Hewlett-Packard Co. and Sun Microsystems, Inc. platforms to DEC VAXs, print servers and LAN bridges — over both wide- and local-area networks using Telnet and DEC's Local Area Transport protocol.

The Console Manager runs on Ultrix and increases the availability of data center resources by providing customizable event monitoring, detection, filtering, notification and corrective action using a Motif interface, DEC said.



Off the shelf
Future plans for Polycenter include file shelving, or the movement of files from on-line media to near-line media and back again. A principal component of Hierarchical Storage Management, file shelving is scheduled to be available with Polycenter in early 1994.

Positive reception

Industry analysts were favorable in their assessment of the product.

"Users don't want to have to look at half a dozen screens to manage systems and networks; they want all their information in one place and in one format," said Chris Christiansen, an analyst at International Data Corp., a market research firm in Framingham, Mass. "This addresses legacy systems and integrates them with standards such as DME compliance."

Some users agreed.

"If it works as an access module [to network and systems management], that would be good," said Sandra Wallace, a member of the technical staff at Mitre Corp. in Bedford, Mass. "They also offer components which allow you to do remote management of Ultrix and VMS through Unix systems, and I like the Motif interface."

Christiansen said DEC is on the right track with Polycenter but must do a better job of getting the message across.

In addition, DEC has improved Simple Network Management Protocol capabilities for the Polycenter Network Manager. The company is offering support for Rdb backup with the Storage Library System and also for seven-cartridge, high-end unattended backups. The Security Intrusion Detector will offer support for Ultrix and Sun's SunOS operating systems. The Security Compliance Manager will support the IBM AIX and HP/UX operating systems. Software Distribution for Polycenter will now install operating system and layered software for Alpha AXP servers on Open VMS, as well as automatic file backup and restore, distribution and installation of network addresses and software licenses.

DECtrace now offers a monitor component as a complement to the DECtrace Collector and Reporter, which collects event-level performance data for any application and is used to characterize the application's performance for tuning and planning resource requirements.

Polycenter Framework Version 1.3 will ship this month and is priced at $1,000, regardless of the processor. The Console Manager, which is slated to ship next month, is priced at $750 per device or $80,000 for 200 devices.

Borland's InterBase

CONTINUED FROM PAGE 55

"The high-end users of InterBase usually understand computers at a relatively intimate level," explained Ted Miglautsch, who designs InterBase servers for marketing applications based on database queries. "The PC person plugs it in, and it had better work," said Miglautsch, vice president at Miglautsch Marketing, Inc. in Milwaukee.

Differences will show

The natural division of the installed base will show itself at the InterBase user meeting in San Diego in May. "It's the downsizers vs. the upsizers," said Kim Everingham, a senior systems analyst at SRI International, Inc., a Menlo Park, Calif., research institute. "The downsizers know all about tuning the database, and the upsizers think it's all very simple to administrate." But new InterBase sites may not have the expertise to troubleshoot their own database problems, he noted.

Sites such as SRI, which runs one InterBase database on a Sun Microsystems, Inc. workstation and another on a Hewlett-Packard Co. HP 3000 MPE/IX, supply much of their own technical support. But SRI also gets hot line support and maintenance from Cognos, Inc., a major InterBase value-added reseller in Ottawa. Cognos also sells its own front-end development tools, including PowerHouse for InterBase.

Praxair, Inc., a Tonawanda, N.Y., firm that designs gas-processing plants, uses InterBase's multigenerational architecture to allow five or six designers to view the same data simultaneously. But Praxair's programmers also do their own database tuning and support. "We don't have a lot of interaction with Borland because we acquired the product before it came to Borland," said Don Dupree, manager of computer-aided design and engineering at the firm.

The California State Assembly in Sacramento receives training and support from Cognos, which installed InterBase, rather than from Borland. The assembly just finished a two-year conversion from scores of Digital Equipment Corp. MicroVAXes to nearly 100 Sun Unix workstations. All of the Sun machines run copies of InterBase, and all are peers in a statewide network that can be accessed by hundreds of users in assembly representatives' offices, from San Diego to San Francisco.

As more InterBase sites move to client/server applications, Borland may yet reap the benefits of owning the rights to the InterBase database engine. Borland plans to sell its Paradox database and PC spreadsheets to existing InterBase users and sell InterBase to new users.

For example, the California assembly's IS agency plans to convert from character terminal interfaces to graphical user interfaces. "Most of our users are using ASCII terminals to the InterBase workstation servers," said John Hutchinson, a systems analyst at the assembly. "We're just now defining what our PC environment will look like." Current applications are developed with Cognos' PowerHouse for Windows tool kit, he said, but Borland's front-end client/server tools, such as Paradox for Windows, will also be considered.

In Brief

Oracle DBMS for Unix

Oracle Corp. has begun general shipments of Unix versions of the Oracle 7 database and of its Trusted Oracle 7 secure database. Announced in June, Oracle 7 was shipped to **Digital Equipment Corp.** VAX customers first, on Dec. 31. Oracle also said it has reached a $24 million settlement of a class-action lawsuit brought by shareholders who lost equity during Oracle stock's rapid decline in 1990. The plaintiffs alleged Oracle had "violated federal securities laws and state common law by artificially inflating" the price of Oracle stock, according to a report Oracle filed with the Securities and Exchange Commission. Oracle said it has settled the suit to resolve the litigation but maintained the allegations are untrue.

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ATTRIBUTES						
Reliability	9.3	8.7	8.9	8.1	7.7	7.9
Ease of Use	9.1	8.2	8.2	8.2	7.9	7.6
Ease of Install/Upgrade	8.9	8.0	8.8	7.8	8.1	6.3
Price/Perform Return	9.1	8.3	8.5	7.9	8.1	7.4
FUNCTIONALITY						
Flexibility	9.1	8.8	8.6	8.4	8.4	7.6
Interface Capabilities	8.9	8.9	8.4	8.1	8.7	7.4
Comprehensiveness	9.1	8.8	8.8	8.3	8.7	7.6
User Friendliness	8.9	7.7	8.3	8.1	7.5	7.0
OS Compatibility	9.6	8.4	8.9	9.0	8.8	7.5
PRODUCT SUPPORT						
Documentation	9.0	8.2	8.6	7.4	6.2	6.8
Vendor Training	8.7	7.9	8.0	7.9	7.6	6.7
Problem Response Time	8.8	7.5	7.2	6.8	6.4	6.2
Quality of Vendor Support	9.0	7.8	7.5	7.4	6.9	7.2
Frequency of Releases	8.5	7.5	6.7	6.9	7.7	7.2
Response to User Request	8.8	7.5	7.8	7.6	7.0	6.5
OVERALL SATISFACTION	9.3	8.7	8.5	8.3	8.0	7.6

Compiled from the latest Datapro reports on DBMS/Computer System Series Software available for each product listed (for Informix, see Informix/SQL). All results are those of actual users of the product as surveyed by Datapro.

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DBMS REPORT CARD

	PROGRESS SOFTWARE	BORLAND	INFORMIX	INGRES
PRODUCT FEATURES				
Ease of use	8.78	8.87	6.80	6.00
Memory requirement	7.25	6.30	6.14	5.11
Ease of programming	8.87	8.74	6.79	6.37
Ability to manipulate data	8.73	7.24	7.14	7.07
Sorting capabilities	8.59	7.24	7.21	7.58
Provision for software security	8.00	6.23	7.00	6.70
Report writing capabilities	7.64	6.54	6.59	6.50
Ease of use of interface	8.13	6.89	6.85	6.50
Software integration capabilities	8.09	6.92	7.20	6.15
Ease of data retrieval	8.89	7.26	7.65	7.04
Satisfaction with product profitability	7.98	6.61	6.79	5.19
Overall quality of product	8.87	6.97	7.35	6.71
PRODUCT FEATURES AVERAGE	8.32	6.82	6.96	6.41
SUPPORT FEATURES				
Provision for customer support	8.20	6.73	6.10	5.44
Charges for training time	6.91	5.79	5.56	4.71
Provision for technical support	7.57	6.14	6.00	5.15
Provision for marketing support	7.04	5.97	5.33	4.04
Documentation & product information	8.62	7.03	6.57	6.00
Frequency of updates & revisions	7.75	6.26	6.05	5.74
SUPPORT FEATURES AVERAGE	7.68	6.32	5.93	5.18
OVERALL AVERAGE	8.11	6.65	6.62	6.00

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Visualization making inroads

By Maryfran Johnson
WALTHAM, MASS.

■ With the newest release of its visualization software development environment now shipping, Advanced Visual Systems, Inc. (AVS) has expanded a bit beyond its technical and scientific roots into a few commercial sites on Wall Street.

The privately held software company, spun off from Stardent Computer, Inc. in 1991, said it hopes to broaden the niche for visual computing, which refers to the use of graphics-based applications for complex data visualization and analysis.

AVS software is a development environment used to build customized applications in medical imaging, engineering analysis, financial modeling, environmental studies and oil and gas exploration and production.

With the introduction last month of AVS5, the vendor expanded the spectrum of tools used to develop applications for processing and displaying complex data and images. AVS5 also incorporates new imaging and volume rendering features culled from the AVS acquisition of Sun Microsystems, Inc.'s SunVision technology.

"By taking the SunVision tools and making them into AVS modules, we now have access to a number of the most common image processing techniques," said Marc Kessler, an assistant professor in the radiation oncology department at the University of Michigan in Ann Arbor. "We were in the habit of having to write these things ourselves."

At Harvard Medical School, AVS software has been used both for joint commercial development in neurosurgical treatment and radiation therapy and for prototyping applications, said Dr. Hanne Kooy, an assistant professor at

Visualization, *page 60*

Gangbusters

"Visual computing, as a concept, is still fairly unknown, but it's going to become much more important as multiprocessor [systems] start coming on like gangbusters with all that additional power," said Marcia Brooks, editor of the "Anderson Report," a technical computing newsletter in Santa Ana, Calif.

Garry Ray

Internet wires users to the world

As a developer, you know the heat is on. The business press and politicians sing arias to downsizing, innovation and education. But the accounting department is questioning the $35 book that you need to sharpen your technical skills. Employee education, always great for lip service, is usually the first benefit to suffer in a budget crunch.

Fortunately, the world's best technical dialogue is only a phone call away. For less than

Ray, *page 60*

4GL for OpenVMS increases customization

By Melinda-Carol Ballou

Users responded favorably to Information Builders, Inc.'s new release of Focus, the firm's fourth-generation language (4GL) for OpenVMS Release 6.5, which offers features that increase performance and the ability to customize reports.

Shared image applications increase the performance of Focus applications by letting users compile applications into object files that are then linked into sharable images using standard VMS services. When these images are installed, users will have the same benefits and performance enhancements experienced using 3GL-based shared images, company officials said.

"We've extended our 4GL into a new arena for large, multiuser applications so that organizations can get the productivity of a 4GL without paying the 4GL performance hit," said Melissa Webster, vice president of the digital division at Information Builders.

Information Builders added a compiler to Focus that lets users prototype and develop in the 4GL. The compiler will then generate the required machine code when the application is ready for production, she said.

"The advantage of having a sharable image is that it saves orders of magnitude on systems resources," Webster said.

Also new with this version of Focus are style sheets that let users create customized, operational reports that take full advantage of PostScript using multiple fonts, sizes and styles, for instance.

Positive reception

Users were enthusiastic about the new features.

"Before the shared image applications were available, it took a long time to move from screen to screen, but this has solved that problem pretty well," said Joe McCafferey, programmer/analyst at the Directorate Information Systems Delivery in Ottawa.

"One of the features we like is the style sheets, which let us use PostScript capabilities for our reports so that we can make them look better for our managers," said Bob Romoser, systems analyst at the Public Utilities Commission of Ohio in Columbus. "And the shared memory reduces the load on our machines and lets us use fewer resources."

Focus for OpenVMS 6.5 is available now. Prices range from $3,200 to $194,000.

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Visualization

CONTINUED FROM PAGE 59

Harvard's Joint Center for Radiation Therapy.

The appeal AVS software holds for financial and brokerage businesses lies in its ability to support the acquisition of real-time data, access large databases on multiple hardware platforms and work with complex analytical models.

"We're not replacing numbers with pictures, but the pictures can help identify which numbers to examine further," said Ian Reid, vice president of marketing at AVS.

The company, with revenue heading toward $5 million, officially opened its doors in January 1992 and has since built its user base to 4,000 customers.

The AVS product includes a large suite of data visualization and analysis capabilities that incorporate both traditional visualization tools such as two-dimensional graphs and image processing, as well as advanced tools for three-dimensional interactive rendering and volume visualization.

AVS software runs on more than 20 Unix workstation and supercomputer platforms, and the firm recently added Cray Research, Inc.'s supercomputers, Digital Equipment Corp.'s Alpha AXP platforms and Data General Corp.'s Aviion systems to its roster.

Among the new features of AVS5 are the following:

- **Enhanced development tools:** A new release of Developers AVS and AVS Runtime Creation Kit includes support for ANSI-C and C++ modules and direct user interface control for application developers.
- **Expanded image processing:** With the addition of SunVision technology, AVS5 added more than 50 modules specifically developed for image processing.
- **Volume rendering:** SunVision tools also added direct 8-bit volume rendering for very large data sets such as 3-D seismic surveys.
- **Presentation modules:** Through a combination of new labeling, annotation and output modules, AVS5 allows users to combine presentation features for printed reports, videos and slide presentations.

The new version is shipping now, with the Developers AVS starter pack priced at $25,000. An AVS runtime license starts at $3,000, but decreases to $1,000 for high-volume developers. End-user AVS licensing starts at $6,500.

Client/server serves up data

By Gary H. Anthes
DES MOINES, IOWA

■ The Principal Financial Group has moved summary sales data from an !BM mainframe — where users previously could retrieve only canned output — to a client/server environment, where they can now get their hands on the underlying data.

The firm said the move has saved expensive mainframe cycles and disk storage while offering users greater flexibility for sales analysis.

The company, a $10.4 billion family of financial services concerns, used to devote 24 hours of IBM 4381 processing at month's end to produce 2,100 sales graphs for managers in the group and pension sales department. The graphs, generated by software from SAS Institute, Inc., were then reported out of IBM's Executive Decisions data presentation tool.

Because the system gave users the ability to view only predefined output, every combination of sales representative, office and region had to be plotted in advance in case someone might want to view that slice of the data. "The majority of them were not looked at in any given month," said Nancy Carley, compensation and research analyst. "How could you look at that many graphs?"

Now, monthly sales data is summarized in minutes on the mainframe and passed to a Novell, Inc. local-area network where it is preprocessed by the SAS software and stored on an AST Research, Inc. server. Sales managers with OS/2-based AST PCs then use SAS/AF, SAS's tool for interactive applications development, generating only the needed sales graphs.

Users, who are not technically trained, use a mouse to select a series of icons defining the graph to be generated, which then "pops up in a couple of seconds," Carley said. Sales histories going back five years and data such as current period sales goals are available, she said.

Life is simplified for systems administrators as well. Previously, when a representative was added, for example, someone had to update a number of screens to build indexes for any graphs affected by the hire. Now, simple table updates are automatically propagated through the system.

Tailormade graphs ahead

Although the new system is far more efficient and moves the data closer to the user, the data sets available for generating graphs are still predefined. The firm will soon receive a beta-test copy of SAS/EIS for OS/2, an object-oriented development environment for building executive information systems. That will allow users to tailor their own graphs and produce ad hoc reports and queries, Carley said.

"We're kind of in the middle now," she said. "We started out just being able to look at pictures. Now we're moving toward being able to work interactively with the data."

Carley said it took her roughly three months to program and set up software for the system.

Database app development takes a faster ride with Arcade

Applix, Inc. in Westboro, Mass., today is scheduled to announce Arcade, an object-based application development environment for rapid construction of client/server database applications on Unix platforms.

Scheduled for delivery in April, Arcade will reportedly enable programmers with no prior experience in SQL or C++ development — but with knowledge of Basic — to build complete graphical database applications, according to the company.

With support for both static SQL and dynamic SQL, Arcade can access information from any Unix-based database, according to the company. The initial release will support applications developed for use with Oracle Corp. and Sybase, Inc. databases. A release scheduled for later this year will be expanded to include databases from Informix Software, Inc. and the Ingres Products Division of The ASK Group, Inc.

Arcade will be released first on Sun Microsystems, Inc. SPARCstations and SPARCservers and will be priced between $1,000 and $2,000 per developer license. Company officials said Arcade is essentially an expanded but standalone version of Applix's ELF (Extended Language Facility) development environment, which is part of its Asterx office automation software.

The primary target market, company officials said, will be mainframe programmers involved in downsizing projects.

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Ray

CONTINUED FROM PAGE 59

the cost of a single college course, you can join discussions on software engineering, programming technique, tool selection and object-oriented development methodologies. The forum we're talking about is the worldwide Internet.

The Internet is a global network of thousands of host computers and probably a million or more users. Once the private domain of college students and research engineers, it now hosts hundreds of companies in varied industries. Universities and military contractors are still at the core of Internet activity (and support most of the hardware that makes the network possible), but commercial users now account for the bulk of the network's expansion.

Internet users share E-mail, software, computer time, technical treatises and plain old gossip. For example, you can obtain thousands of public-domain documents and tools using a program called File Transfer Protocol. For E-mail, there are gateways to all of the major services, including CompuServe and MCI Mail. Many companies have installed Internet gateways to their internal E-mail systems.

For most users, the hundreds of Internet conferences are the biggest draw. Collectively known as "network news," these cover everything from the absurdly trivial to the profound. For the inquisitive developer, there are dozens of conferences on computer technology, including at least 10 self-help groups dealing with a variety of programming languages, state-of-the-art discussions on object-oriented development, forums where developers can share experiences in CASE and the latest hot-headed arguments about "the best" operating system.

Gaining access

To participate in these conferences, you'll need an Internet account. Not too long ago, that was a problem: Accounts were available only to those at Internet sites such as universities and government organizations. Today, commercial use of the Internet makes it much easier to gain access.

If you're in a larger company, someone may have already installed an Internet node. Check with your Unix coders or a systems administrator to see if you already have a means to get on the network. Or you can become an advocate for installing a dedicated Internet gateway, but this can be a costly endeavor requiring hardware, a dial-up or dedicated network link, monthly fees and a systems administrator. Firms such as Sprint Corp. in Herndon, Va., and Advanced Networks and Services in Ann Arbor, Mich., can give you the details.

For most individual users, the simplest and quickest route may be a public-access provider. There are dozens of these throughout the U.S., including The Well in Sausalito, Calif., and The World in Brookline, Mass. Both offer the full range of Internet services for monthly fees of $10 to $20. You can also find local Internet providers with a smaller set of offerings (sometimes limited to E-mail) and correspondingly lower fees. However, it is best to go with a full service provider; you are unlikely to find network news conferences through a no-fee provider. Services such as CompuServe offer gateways to the Internet, but not network news.

Finally, you can get detailed information on the universe of Internet services from a book published by O'Reilly & Associates, Inc. in Sebastopol, Calif. Called "The Whole Internet User's Guide & Catalog," this 375-page directory by Internet authority Ed Krol will get you up and running pretty quickly.

Using the Internet may present a short learning curve, but once you get started, you'll find much that will stimulate and entertain you and keep you abreast of top development technology.

Ray is a *Computerworld* senior editor, application development.

To support gung ho company expansion, Publix Super Markets needed to create an agile **new IS** department. Reinventing old-guard IS, though, was like **battling**

Publix *no. 1* enemy

By Mark Mehler

For Publix Super Markets, Inc., a proposed $9 billion expansion had the potential to add up to a lot of cabbage — but only if the information systems department could produce.

In 1989, the Lakeland, Fla., food retailer embarked on "Vision 2000," a huge, long-term effort to boost company sales to $25 billion by the year 2000.

To help keep ahead of rivals such as Winn-Dixie Stores, Inc. and A&P, Inc., the $16 billion privately held firm is planning a major expansion through the Southeast. It is an ambitious plan that requires huge support from IS.

But according to Daniel Risener, vice president of IS at the 400-store chain, until a three-year departmental re-engineering effort kicked in, his department did not have the resources to support the vision. "The systems getting built," Risener says, "were often things that team leaders dreamed up to keep their people busy."

Today, "make-work" projects are as out of place at Publix as rotten produce or stale bread. The company has overhauled its IS department, integrating two departments into a single group with a flat reporting structure. Structured job titles are gone, replaced by positions defined by "role functions."

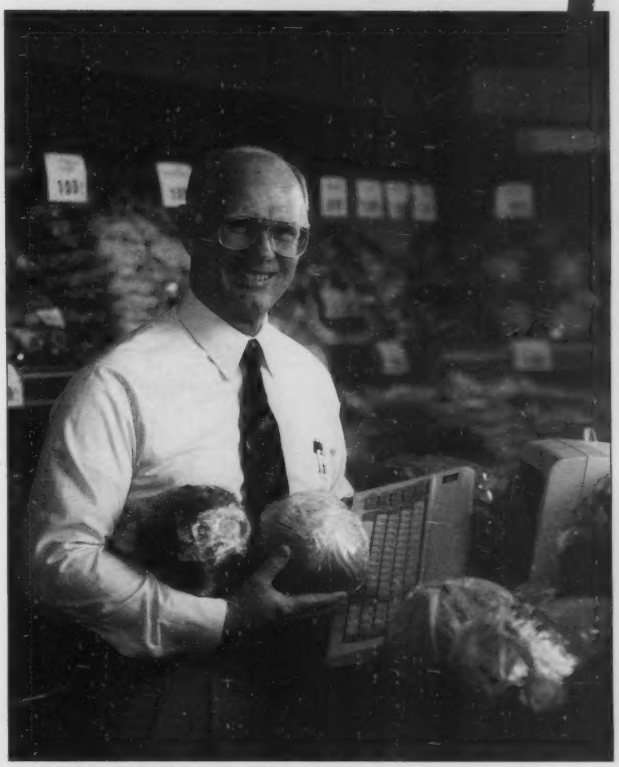
Communication between user departments and IS has been streamlined by the centralization, too. As a result, projects can be implemented based on business impact, not how hot the technology is.

Analysts applaud the moves.

Joseph Ronning, a food retail analyst at Brown Brothers Harriman & Co. in New York, says today any supermarket chain must leverage technology to expand in the face of tiny margins and relentless competition.

But by moving into a new geographical area, Ronning notes, "you're talking about big logistical problems and high advertising costs." Such a giant rollout, he says, would be impossible without a strong technology infrastructure.

"This is a very low-margin business," adds Michael Sansolo, editor of *Progressive Grocer*, a trade magazine based in Stamford, Conn. "The leaders will be companies that can use technology either to increase sales and market shares or lower costs. Publix is one of the most respected supermarket chains, a class organization."



Publix's Daniel Risener *says strategy, not cost, drives key IS revamp*

inside

IS and corporate row: creating strategies. **page 64.**

Intelligence files: quick hits on hot topics. **page 65.**

Hammers and wrecking balls

Company officials concede that Publix's technology use wasn't always so smart.

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Mehler is a free-lance writer in Jackson Heights, N.Y.

Publix enemy No. 1

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Three years ago, when Vision 2000 was drafted, the 225-member IS staff was deployed along traditional business lines, divided into two subdepartments: technical support and IS development.

The latter in particular, Risener says, was hierarchical, inflexible, narrowly focused, slow-moving and bureaucratic. Each development team was devoted to certain business systems, he says, that "had little communication with each other." Worse, there was no way to share or move resources to address business priorities.

Realizing they had a serious problem, IS called in Michael Hammer, a Cambridge, Mass.-based celebrity re-engineering consultant. IS also sought help from a "best practices" study done by the Prism group at CSC Index, Inc., also in Cambridge. These influences led to a three-year effort to better align IS development with the goals of Vision 2000.

The Hammer-inspired team set about smashing existing functional boundaries, including combining the two subdepartments, creating project managers and instituting peer reviews (see story below).

According to Risener, these key decisions and others were driven by strategy, not cost. In fact, Risener claims Publix didn't even analyze project costs and instead from the start saw Vision 2000 as an ongoing process.

To help employees understand the changes, Publix IS management went to great lengths to broadcast goals. The team kicked off with a special theme dinner for IS staff members at a local country club. It also published monthly newsletters to keep staff abreast of changes and held regular "town meeting-style" open discussions to get staff feedback.

Early signs are positive

Even though it's early, employees seem sold on the new approach. Chris Brabbs, a senior systems analyst and previously a project manager, says she believes these planning sessions have already resulted in improved business focus.

For example, Brabbs says, "We're working now on a keypunch scanning and validation project. We're having some success in getting all the retail divisions to agree on how it should work, its functionality, so everybody ends up being pleased. This could never have happened under the old organization."

Created in a team image

Publix converted two IS departments into one flat reporting structure with emphasis on integration of IS and user needs

1989	1992
• Two departments, 100 associates	• One department, 100 associates
• Hierarchical organization chart	• Flat, matrix reporting structure
• Teams/team leaders	• Projects/project managers
• Red tape, high supervision	• Boundaries, empowered associates
• Poor communication	• More communication (internal and external)
• Single-input performance evaluations	• Peer/customer performance evaluations
• Team priorities and team assignments	• Publix priorities and master schedule
• EOY deadline planning	• Integrated technology & application planning
• IS focus	• Customer focus
• Sys Development vs. Tech Support	• Business analysts, planners, project managers
• Team leaders as user contacts	• User coordinators, request analysts
• Technical/product training	• Overall business orientation and more
	• Technical, leading-edge education

Source: Publix Super Markets, Inc. CW Chart: Janell Genovese

But her loudest praise is reserved for the business analyst role, which she says gives operations people a single point of contact and a means of determining relative cost/benefit.

Randy Campbell, one of eight project managers at Publix, also gives the reform high marks.

Prior to the reorganization, Campbell worked as a programmer/analyst devoted to inventory management. He says his new role calls for greater interpersonal and communication skills and requires a much wider view of company activities.

"At first, I was uncomfortable," Campbell confesses. "I'm having to deal with systems that someone else designed and wrote. I knew my area — point of sales and store accounting [systems] — but I knew nothing about the host side, for example. There is a higher risk of failure now. But I'm finding it all very interesting and challenging."

Risener says that the new, centralized management has cut out last-minute resource shuffling that used to occur near end-of-year deadlines while cutting down on scheduling costs and hassles. A single resource administrator, for example, now handles all vacation and training schedules, a job that had taken up to 30% of the higher paid team leaders' time.

Ken Deal, user coordinator for warehousing and distribution, lauds the plan's flexibility and the vision it has helped foster. "Had Hurricane Andrew hit us and knocked our [south Florida] warehouse out of commission," he says, "we could not have shifted distribution to another location. IS is coming out of its tunnel vision, no longer looking only at what's good for one distribution center."

Consultants also see a lot to like in the effort. In fact, Ouellette & Associates Consulting, Inc., a Bedford, N.H., consultancy, liked the efforts so much that it awarded Publix its fifth annual "Developing The Human Side of Technology Award."

Another consultant familiar with the project, Sarah Kaull at CSC Index, says she likes the practice of giving workers a major say in their career paths and not penalizing those who choose a nonmanagerial track.

"Publix recognizes that if it wants to develop skills, [the company] has to have a salary structure that provides equal compensation," says Kaull, director of Prism. "What you have in most IS organizations is a structure that encourages the Peter Principle: Good systems analysts wind up being poor managers."

Despite such praise, it's clear that much work remains.

Moving from management

Campbell says several new project managers, feeling like fish out of water, have given up in frustration and moved back to technical posts.

To fix such problems, he says, he believes that roles must be further refined. For example, while project managers are clearly seen as the glue that ensures proper resources are assigned to each project, the kinds of skills needed to handle the role are less clear.

Some things have become a bit more complex, Deal adds. "Occasionally, small needs arise that in the past I could have filled by simply calling a programmer and getting a few minutes of time," he says. "Now, of course, there's more bureaucracy [in funneling reports to business analysts]. I have to admit that sometime I do a little end run around bureaucracy to get something done more quickly."

Publix enemy No. 1, *page 64*

IS role model

Publix's IS department is broken down into functions rather than job titles

Provide infrastructure

TOP PRIORITIES

Maintaining organizational structure by developing standards and procedures, including job responsibilities and training plans.

Perform planning

TOP PRIORITIES

Planning resource requirements while assisting in business-area planning, performing application planning and keeping up with new technology.

Manage development work

TOP PRIORITIES

Managing projects, prioritizing and processing requests and performing change management and reviews.

Manage problems

TOP PRIORITIES

Ensuring that technical problems are under control during normal working hours and after hours.

Manage resources

TOP PRIORITIES

Keeping track of data, facilities, consultants and vendors and personnel. Tasks range from resource allocation to performing peer reviews.

Source: Publix Super Markets, Inc.

Publix's shopping list for successful re-engineering

Here are some of the main steps Publix Super Markets took to realign and reinvent its IS department:

- Two subdepartments, IS development and technical support, were combined into a single entity for improved technology planning.
- Teams and team leaders were abolished and replaced by a flat, matrix organization. Individual project teams draw from resource pools of similarly skilled developers.
- Project managers, systems analysts and programmers were moved away from performing multiple jobs in one small area of the business. Efforts were made to more closely match people and skill sets while deploying staff members throughout the company.
- To keep the process going, a centralized management system was established for work assignments, project management, technology planning and human resource management.

Under the plan, "business analysts" and "planners" assign priorities on incoming and continuing projects based on business needs. "User coordinators" or liaisons and "request analysts" from the user community assist in the process. Analysts meet once a week and hash out logistics, scheduling and project importance across a bargaining table.

Each project request ultimately channeled into the IS development group comes with its own business unit sponsor, who shares the risk with IS. The divisions also get back summary information, telling them where the IS resources are being deployed within their units.

- IS peer reviews were introduced. In the past, team leaders did annual performance evaluations. While traditional reviews tend to focus on previous months' work, explains Daniel Risener, vice president of IS, peer reviews are ongoing. "Every time someone does something, it's recorded and logged," he explains.

Here's how it works: At year's end, a worker selects the peers he wants to evaluate him. An administrator then compiles the responses and puts together a report. "Peers tend to be more honest, and the employee gets a truer picture of how well he's performing and what areas he needs to improve upon," Risener says.

--Mark Mehler

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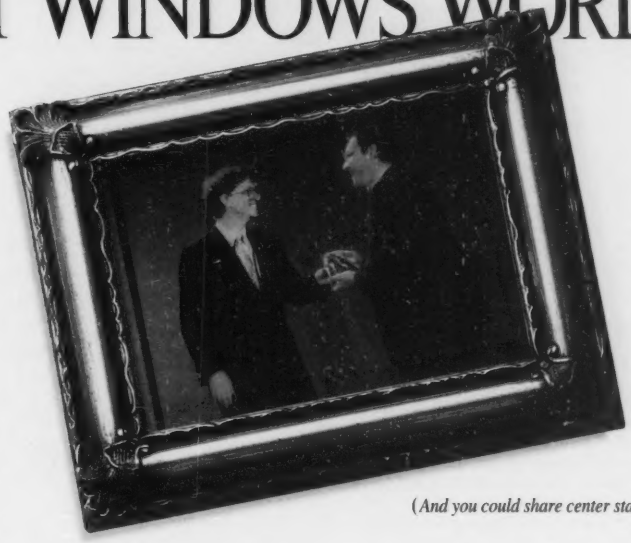

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* The Windows Open Entry Kit contains all details, rules and qualifications for this contest. Contest is void where prohibited by law. No purchase necessary. ©1993 Computerworld, 375 Cochituate Road, Framingham, MA 01701-9171, Tel: 508-879-0700, Fax: 508-879-0446. An IDG publication. Computerworld is a trademark of Computerworld, Inc. , other brand or product names are trademarks or registered trademarks of their respective holders. Microsoft is a registered trademark and Windows is a trademark of Microsoft Corporation. Windows™ World Conference and Exposition and Windows™World Open are properties of INTERFACE GROUP - NEVADA, Inc.

Publix enemy No. 1

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CSC Index's Kaull recommends that IS organize along natural process lines — business systems development, technology innovation, architecture and planning, for example. "They haven't gone the full nine yards," she notes.

Vision 2000 is a long-term effort to boost Publix's sales to $25 billion by the year 2000.

And so far, Publix is nowhere near the huge sales leaps it desires. Last year's revenue rose a modest 6% to 7%, from $6.2 billion to $6.6 billion. Still, argues a company spokesman, "any increase in supermarket business in this recession represents good performance."

Publix's IS group is hardly waiting for the hefty hikes to accomplish themselves, however. Several key IS projects are under way, including a total warehousing system that will serve three independent groups and 20 distribution centers and computer-aided software engineering-generated systems that will eventually let divisions access and share mission-critical applications.

Plus, Risener says, plans are afoot to form a corporate steering committee to even more closely base IS goals on Publix priorities, as well as create a more formal career training plan based on those core competencies. He says he is sure that IS can bring home the groceries.

"Right now I feel confident that every project we undertake addresses a real business goal and not a supervisor's request for an X/Y screen change," Risener says.•

Executive Track

Craig Burlingame, credited as being the architect of the Hyannis, Mass.-based **town of Barnstable**'s information systems organization, is on his way to a new post as director of teleprocessing for Massachusetts' **Criminal History Systems Board**. The move puts Burlingame in charge of all technical aspects of the agency that oversees the statewide Criminal Justice Information System and Network, which links 500 agencies and interfaces with the FBI's National Crime Information Center.

Wayne, N.J.-based **Valley National Bancorp** recently promoted its top-ranked information technology officer. Former senior vice president **Peter Crocitto**, a 15-year Valley veteran, is now first senior vice president. In addition to information technology, Crocitto is in charge of bank operations.

Dan Raleigh, 39, has been named vice president of the MIS department at **Designatronics, Inc.**, a New Hyde Park, N.Y., manufacturer. Prior to his promotion, he was manager of the division.

At the New York-based accounting firm of **Goldstein Golub Kessler & Co.**, former independent consultant **Joel D. Levy** was named the new director of MIS. Levy, 48, was additionally named principal in the firm's business solutions and services group.

John R. Garvin, 45, is the new chief information officer at **GFT USA Corp.**, a New York retailing subsidiary of Turin, Italy-based **Uppo GFT**. Garvin was formerly president of his own consulting company, the Garvin Group.

Alan J. Lokensgard has been appointed director of adminstrative computer services at Chestnut Hill, Mass.-based **Pine Manor College**. A longtime IS veteran with experience on the vendor and consultancy fronts as well as in management, Lokensgard most recently served as manager of administrative systems and procedures at the Woods Hole Oceanographic Institute in Massachusetts' Cape Cod.

Minneapolis-based medical device manufacturer **Medtronic, Inc.** has elected **Edith W. Martin** to its board of directors. Martin, 47, is vice president and CIO of the **International Telecommunications Satellite Organization** — a position she took last year after having served as vice president of The Boeing Co.'s High Technology Center since 1984.

George Harris, vice president of Customer Satisfactionat Cosa Mesa, Calif.-based **Symbol Technologies, Inc.**, has been elected chairman and president of the Fort Myers, Fla.-based **Association for Services Management International**. He succeeds ICL Europe Vice President of Services Franck Armaingaud as chief executive of the 6,000-member organization of technology services professionals.

Norman L. Haylett has been promoted to vice president of data services at **The Dollar Savings and Trust Co.** Overseeing the day-to-day operations of the data services department, Haylett was most recently senior data processing officer. He has been an employee at the company since 1972. Kevin J. Brogley was also promoted, from data processing officer to senior data processing officer.

John Reid, vice president of information technology at **Amoco Corp.**, has been elected to **The Conference Board's Council of Information Management Executives**. Based in New York, the board is one of the world's leading business membership organizations. Its council meets three times a year to allow top IS executives to network in the non-electronic sense.

Louis Fried

Let the IS execs play!

Surveys during the past few years have consistently shown that IS directors and CIOs have identified "aligning information technology and MIS goals with corporate business strategy" as their primary concern, and it's a good thing: The failure to create such alignment can lead to disappointment with IS responsiveness or major business problems.

Some years ago, as vice president of MIS at a West Coast insurance company, I was informed one day by the president of the company that he had just completed the acquisition of another company and that he would like to have the information systems of the other company merged with those of our company. I immediately made arrangements to visit the acquisition and examine its systems with a small group of my senior analysts.

> IS managers must be allowed to *influence* corporate business strategy.

After a week of examining those systems, which were based on a different operating system from ours, we put together a project plan and a tight schedule to accomplish the integration within six months. Satisfied with our work, I returned to the president with a presentation of our approach.

The president's response was jarring: "I want their systems merged with ours by the end of the month so that we can consolidate our books," he said.

No explanation that I could provide seemed to make sense to him. After all, the acquisition had computerized systems, and so did we. What was the big deal?

We ultimately satisfied the problem of consolidating the books by writing a few programs that unloaded their month-end files, reformatted them, translated the chart of accounts, and input their figures to our month-end closing system. However, the integration of their systems really did take about six months, and our president never did understand it.

Preparation, education key

If I had known in advance that we were considering growth by acquisition as a corporate strategy (several other acquisitions followed this one), I would have been able to prepare my staff. More importantly, I would have had time to educate management about the implications of acquisitions for IS.

About two years ago, a friend who is CIO of a major corporation ordered substantial upgrades to his company's mainframe equipment only to find out through the newspaper that his company planned to divest itself of several business units and return to a focus on its core business.

A large Eastern firm's IS director had gained a reputation with management by tightly controlling IS costs, taking pride that IS costs for his firm were well below average for the industry.

Last year, the firm undertook a Total Quality Management program. Surveys from that program found that the greatest volume of complaints in the company were about the antiquated computer applications and the lack of responsiveness of IS to business needs.

Suddenly, the IS director found top management doing an about-face and questioning the judgment that had permitted the company's systems to fall behind the competition.

These examples show the need for corporate/IS alignment, but they show something else as well.

Learning about corporate strategy and sitting in on boardroom meetings is not enough. To really be successful, IS managers must do more than align IS with business strategy — they must *influence* corporate business strategy.

Getting involved

Corporations move through modes of acquisition, divestiture, alliances, just-in-time manufacturing, cooperative product design with suppliers and customers, new and faster delivery systems and other business directions.

Increasingly, these changes are dependent on fast and flexible responses from IS. It is evident that many future business strategies cannot be implemented without the support of IS. The failure to consider the advantages or limitations of information technology can result in the failure of business strategies or the inability to meet competitive pressures or market opportunities.

This transition has been made by some firms, notably Wal-Mart Stores, Inc., Hewlett-Packard Co. and Merck & Co., but it is not an easy one to make. One IS director I know likened the difficulty to the old analog of trying to stuff an angry wildcat with wet noodles.

Another told me that she did not expect to make much progress until a new generation of computer-familiar executives replaced the current generation of top management.

Until IS managers become participants in the strategic planning process instead of recipients of the process results, alignment of IS with business strategy will continue to remain a major issue.

Fried is vice president of information technology consulting at SRI Internatiional, a consultancy in Menlo Park, Calif.

Intelligence Files

Whither pen-based?

Although conventional wisdom pushes pen-based computing as a haven for nontypists, a new study suggests that nonusers instead do not need computers or are not convinced of the value of the applications.

The authors predict that pen-based computing needs to offer functionality not currently available in traditional mouse and keyboard systems, rather than adapt applications already established on keyboard-based machines.

Source: "Whither the Pen-based Interface?" *Journal of Management Information Systems*, Winter 1992-93, Vol. 9, No. 3. Robert O. Briggs, Alan R. Dennis, Brenda S. Beck and Jay F. Nunamaker Jr., authors.

EDI: Growin' around town

The just-released "1993 Census Report of 'EDI Town' "shows electronic data interchange (EDI) growing at a healthy rate, although varying by geographical region and industry. For example, the report shows 60% of EDI use is in the manufacturing sector, with 14% in wholesale trade, 8% in transport/utilities, 8% in retail and 10% miscellaneous.

Source: "1993 Census Report of 'EDI Town,'" EDI, Spread the Word Publications, Dallas.

Twist on IS investments

An increasing number of businesses are using a variety of new approaches to evaluate their next-generation information systems investments. Traditional financial approaches cannot capture the true business value of today's emerging technologies. The shift in IS decision-making to executive row, along with the increasing complexity of investments associated with enterprisewide computing and the need to better link business goals with IS, are some of the big factors behind today's changing technological investment perceptions.

While traditional analyses are needed to assess IS, they must be used in conjunction with nontraditional concepts, such as establishing a research and development budget to evaluate new technologies with no return on investment involved.

Source: "New Approaches to Assessing the Value of Information Technology," NCR Corp. Strategic Consulting Group, Dayton, Ohio.

Warehouses add tech value

Public warehouses, which lease distribution space and services, are using technology to move from being short-term storage solutions to becoming third-party service providers. Technologies such as EDI and bar-code scanning let these warehousers add value to their service, providing systems implementation and training to clients in some cases.

Source: "Public Warehousing: The Original Third Party," *Distribution Magazine*, Lisa H. Harrington, author.

Quality air by computers

Weyerhauser Co. is using technology to keep on the safe side of the pollution law. Michigan integrator Island Automation worked with the firm to develop a computer-based system to track and control the vast amounts of data required to keep its emissions below the levels contained in the company's air quality permit. The system calculates emission and production levels with six-minute rolling averages and hourly, month-to-date and year-to-date averages.

Source: *Pollution Engineering*, Feb. 1, 1993.

Award

UPS head lauded for IS use

Kent C. "Oz" Nelson, chairman and chief executive officer at Atlanta-based United Parcel Service, Inc., last week became the 11th winner of the Excellence in Technology Award, presented annually by Gartner Group, Inc. and The Conference Board.

The wizardry of Oz "played a key role in . . . transforming an operations-oriented company into a master of modern technology," said Gartner Group President and CEO Manny Fernandez. "Almost overnight, UPS built a world-class information system for international package deliveries."

Prior to 1986, UPS — a worldwide company with revenue of approximately $16 billion and a package/document traffic volume recently estimated at 2.9 billion a year — did not rely on information technology to drive its distribution business, reportedly the largest in the world. Nelson, then a senior vice president, was charged with changing all that.

At the head of the newly assembled Technology Task Force, he set out to forge a strategy aimed at "fundamentally overhauling technology at UPS," a company spokesman said.

The group started out with a $1.5 billion budget and a five-year plan, the spokesman said. "But the fact is, we ended up spending that much well before the five years was up," he added. "The effort ended up costing multibillions."

The plan came in on time. By 1991, UPS was able to boast a network that linked six mainframes, approximately 250 minicomputers, some 40,000 PCs and an estimated 75,000 handheld units, connecting some 1,300 distribution worldwide distribution sites.

Today, enabled by a cellular-based nationwide mobile service and supported by a $100 million data center in Mahwah, N.J., the company relies on an electronic data storage and retrieval system to track an estimated 11 million packages a day delivered to destinations around the globe. The company is prepared to invest an additional $3 billion toward an expansion of the system that will make real-time package tracking a reality by 1997. — *Nell Margolis*

Calendar

MARCH 14 - MARCH 20

National Automated Clearing House Association (NACHA) Conference. San Diego, March 14-17 — Contact: NACHA, Herndon, Va. (703) 742-9190.

InterChange Technical Writing Conference. Lowell, Mass., March 15-16 — Contact: Dirk Messelaar, University of Massachusetts, Lowell, Mass. (508) 934-2405.

Lap and Palmtop '93 Exposition. New York, March 15-16 — Contact: Laptop Expositions, New York, N.Y. (212) 682-7968.

UniForum Technology Managers' Conference. San Francisco, March 15-16 — Contact: UniForum 1993, Registration Dept., Carol Stream, Ill. (708) 260-0396.

13th Annual Conference: "Clinical Information Systems." March 15-17 — Contact: Laura Lee, Society for Clinical Data Management Systems, Los Angeles, Calif. (213) 224-6259.

The Mobile Professional in the Enterprise Corporation. New York, March 16-17 — Contact: Betsy Gray, The Yankee Group, Boston, Mass. (617) 367-1000.

The Workgroup Computing Conference. Washington, D.C., March 18-19 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3870.

The 1993 Long Island Conference of Artificial Intelligence and Computer Graphics. New York, March 20 — Contact: New York Institute of Technology, Old Westbury, N.Y. (516) 686-7623.

MARCH 21 - MARCH 27

PageMaker Conference. Boston, March 22-23 — Contact: PageMaker Conference and Exhibition, Seattle, Wash. (206) 633-3431.

Apollo Users Group International Conference. Chicago, March 22-24 — Contact: Information Resources, Inc., Chicago, Ill. (312) 559-2360.

The Data Warehouse: Design and Implementation. San Francisco, March 22-24 — Contact: Barnett Data Systems, Rockville, Md. (301) 762-1288.

The International DataEase Users Conference and Exposition. Orlando, Fla., March 22-24 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3870.

The Second International Conference on Software Methods. Orlando, Fla., March 22-24 — Contact: Technology Transfer Institute, Santa Monica, Calif. (310) 394-8305.

EDI 2000. Boston, March 23-24 — Contact: EDI 2000, Dallas, Texas (214) 475-1838.

Business Solutions Conference and Expo. Boston, March 24 — Contact: Microsoft Corp., Seattle, Wash. (800) 677-4697.

Hands-On Unix Internetworking. San Francisco, March 24-26 — Contact: American Research Group, Inc., Cary, N.C. (919) 380-0097.

The Ninth International Conference on Engineering Information Systems. Fort Lauderdale, Fla., March 24-26 — Contact: Supriya Pande, Management Roundtable, Boston, Mass. (617) 232-8080.

Association for Corporate Growth 1993 Conference. Orlando, Fla., March 24-27 — Contact: The Association for Corporate Growth, Inc., Glenview, Ill. (708) 699-1331.

CeBit '93. Hannover, Germany, March 24-31 — Contact: Hannover Fairs USA, Inc., Princeton, N.J. (609) 987-0092.

MARCH 28-APRIL 3

14th Annual IS Performance/Capacity Management Conference. Scottsdale, Ariz., March 30-April 2 — Contact: The Institute for Computer Capacity Management, Phoenix, Ariz. (602) 997-7374.

Voice '93 Spring Conference and Exposition. San Diego, March 30-April 1. — Contact: Linda Wilson, *Voice Processing Magazine*, Houston, Texas (713) 974-6637.

JAD/CASE Conference. Washington, D.C., March 31-April 2 — Contact: ATLIS Performance Resources, Inc., Rockville, Md. (301) 770-3000, ext. 305.

Client/Server and Distributed Computing: Designing the Application. Washington, D.C., April 1-2 — Contact: Barnett Data Systems, Rockville, Md. (301) 762-1288.

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Apple Enterprise Computing Conference. San Francisco, April 5-7 — Contact: Apple Enterprise Computing Conference., Mountain View, Calif. (415) 966-8978.

Communications Tokyo '93. Tokyo, April 5-8 — Contact: Ron Atkins, E. J. Krause & Associates, Inc., Bethesda, Md. (301) 986-4538.

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The Fifth Annual Data Administration Management Association (DAMA) International Symposium. Boston, April 18-21 — DAMA International Symposium, Boston, Mass. (508) 967-7132.

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To ~ HELL ~ *with* tradition

Japanese users turn to downsizing as the recession takes its toll

By Lori Valigra

A recession can have a bright side. Just ask Japanese computer users. The prolonged downturn in Japan's economy has enabled that nation's information technology managers and users to reap some long-overdue benefits.

Japan's computer market has been dominated for some time by only a handful of large corporations such as Fujitsu Ltd., Hitachi Ltd., NEC Corp. and IBM Japan Ltd. Though famous for cozy, supportive relationships with their customers, vendors (which offered mostly proprietary systems) could set and keep equipment prices high, at virtual monopoly prices. Users had invested so much in software that such pricing practices were tolerated.

But vendors are bowing to many pressures: the recession in Japan, soft demand, shrinking user budgets and price wars among foreign PC competitors (see story page 69).

This means users are getting a windfall: Vendors are now more responsive. They are willing to negotiate prices and rethink their mainframe-centric ways — changes that dovetail with companies' interest in client/server and other downsizing approaches. Vendors are even willing to help customers set up multivendor installations. These moves would have been unheard of even a couple years ago.

Mobil Sekiyu K.K., for example, needed to install proprietary software on a network including IBM equipment. "IBM sent engineers to work at the other vendor's premises for free to make sure the software would work. It was not a big sale for them. But IBM decided to listen to the customers and do anything it takes to get along with them," says Charles F. Cronheim, director of information systems at Mobil Sekiyu, the Tokyo subsidiary of Mobil Oil Corp.

"Anything it takes" includes negotiating prices on equipment so customers can stretch shrinking purchasing budgets. Price negotiations come in handy as the Japanese join the worldwide trend to replace mainframes with client/server systems and bring more computing power to individual departments.

According to a 1991 survey of 1,400 multiuser sites by research firm IDC Japan, there was a clear movement to

Japanese users, *page 68*

Valigra is a Knight Science Journalism Fellow at MIT and the former Tokyo bureau chief at International Data Group's International News Service.

Lisa Blackshear

Look who's changing

Tight times make vendors and prices more flexible.

The predictability and order of a virtually monopolistic computer market, run by a small group of large companies selling proprietary systems, became history this year in Japan.

Ironically, the breakup of IBM, once known as *kamisama*, or god, by many Japanese, has sparked some fundamental changes in the Japanese computer market.

For one, price competition has entered the picture (see story page 69), brought on by a long recession and user movements toward both smaller systems and ones purchased from multiple vendors. This has meant that the myriad of middlemen and other layers accepted as normal business practice in the past have been under scrutiny since the end of the 1980s boon in Japan — the time of the so-called "bubble economy."

"Japanese firms are now in a state of shock. Until last year, when the 'bubble' burst, they had a structured and orderly domestic market that could tolerate inefficiencies and a half-dozen middlemen between the manufacturer and the end user. They have been hard hit recently from different angles all at once," says Charles F. Cronheim, director of IS at Mobil Sekiyu in Tokyo.

Previously hesitant to negotiate prices, the Japanese subsidiary of IBM, called IBM Japan, and its competitors have had to change with the times. That includes negotiating prices, working with other suppliers in multivendor installations and focusing on solutions using smaller systems.

Though IBM Japan had been talking of change for many years, Cronheim says the bad news deluging the parent company lately has caused it to wake up and realize it has no choice but to change. "Since the middle of last year, IBM Japan started to behave in a manner that sug-

Changing, *page 68*

Japanese users

CONTINUED FROM PAGE 67

smaller platforms expected in 1992. Some 16% of respondents said they were moving applications off centralized hosts, while 21% were focusing most new application development on small systems.

Also, sales of small business computers, such as IBM's Application System/400 and Fujitsu's K series, were expected to rise 12% to 15% in 1992, up from 10% in 1991. On the other hand, mainframes such as IBM's 370/390 and Fujitsu's M series went from sales of 7% to 9% in 1991 to a predicted 5% to 8% for 1992.

The downsizing trend may accelerate as firms take advantage of more affordable PCs. Though Japan is well-known for making and exporting inexpensive PCs, ironically, software and hardware prices have been high for Japanese users. NEC, which owns 50% of Japan's business market for PCs, had kept prices artificially high during the past decade, market watchers say. Those users who bought NEC products had little choice: NEC is the only PC company in Japan that offers thousands of software titles for nearly any application.

Shaking the foundations of Japan's monopolistic market are newcomers Compaq Computer Corp. and Dell Computer Corp., which since last fall have introduced a series of price cuts that now make PCs affordable to Japanese user firms on a one-per-employee basis.

"1993 may be the year of big changes in the use of PCs in major Japanese companies," says Eiichi Matsubara, director of planning for information management and systems at Japan Airlines (JAL) in Tokyo. Compaq and Dell's PC prices are "half or one-third that of current PCs, so it is cheap to distribute one PC per employee." JAL's IS department already has one PC per employee, and that usage rate is expected to spread companywide in the next few years.

Private sector companies in Japan average four employees per PC, according to the Japan Electronic Industry Development Association.

Like its U.S. counterparts, JAL has seen a flood of red ink in the past year. To help stem the hemorrhaging, the airline company decided to change direction in information processing last June. In a plan due to be implemented by 1998, JAL is moving to network server systems for departments or business areas and to PCs. JAL has 13 mainframes and about 2,000 PCs used as dumb terminals.

There's no stopping progress

In a survey of 1,400 multiuser sites, IDC Japan found that investments in new equipment remained strong despite Japan's economic troubles. Survey respondents registered an 8.5% growth in their budgets in 1992, up from 7.5% a year earlier. Of note: Budgets in the financial industries rose 5.3% in 1991 and 8.7% in 1992. Wholesalers and retailers, which saw budgets fall in 1991 to 2.1% and 3.3%, respectively, expected rises to 6.7% and 12.1% in 1992.

The airline, a former monopoly in Japan, recently began 10 client/server pilot projects to decide which systems look most promising. It is using networks of Apple Computer, Inc. Macintoshes to perform maintenance on pilot training simulators and IBM OS/2 systems for flight operations. The company is using Microsoft Corp.'s Windows in a general ledger application and is looking at Unix and DOS V, a product that bridges Japanese and English DOS. The pilot projects should be completed in about a year, according to Matsubara.

"Downsizing is definitely happening in Japan. We've purchased our last mainframe upgrade," says Mobil Sekiyu's Cronheim. The firm bought its first computer in Japan in the 1950s and now uses an IBM 9121-440 and a 3090-200J, as well as about 1,500 PCs.

But as U.S. companies have known for years, the task of downsizing can be monstrous. "It's hard to rationalize because you must move a lot of functions off a mainframe before you can shut down a data center," Cronheim says.

Firms such as JAL, along with banks and security companies, typically have invested in more than 10 million lines of proprietary system source code.

"Rebuilding mainframe software assets would be very expensive," Matsubara says. He figures it would cost his company about $2 billion or $3 billion.

"There is no way to change quickly to downsizing platforms. It would take about 10 years," he adds. He says U.S. companies are ahead in moving to smaller platforms because of the popularity of PCs in U.S. offices. Japanese companies are still on a learning curve.

Better late than never

Slow and steady is better than not at all for many. Mobil Sekiyu and several other foreign multinational corporations in Japan are consolidating mainframe processing to trim costs and eventually begin the downsizing process.

"We'll have a lot of mainframes in one place and then can adjust capacity as demand goes up or down," Cronheim says. Mobil Sekiyu will consolidate worldwide operations in the next couple of years and probably locate the international data center in the U.S., he adds. Users will then pay for access to the mainframes rather than new on-site hardware.

Cronheim says locating the center in the U.S. would save 40% of the cost of placing it in Japan and 10% to 15% of the cost of locating it in Europe.

Once the consolidation is done, Mobil Sekiyu will be able to transfer some jobs to PCs and better realize downsizing economies, Cronheim says. •

Changing

CONTINUED FROM PAGE 67

gests they are really serious about changing. My direct sales representative can now pick up the phone, call IBM Japan's vice president in charge of Asia/Pacific and actually talk to him," he adds.

Last October, IBM Japan appointed a new president, Kakutaro Kitashiro, and promoted former President Takeo Shiina to chairman and chief executive officer. At the same time, IBM Japan split into three independent companies: IBM Japan; IBM Japan General Business Co., charged with targeting midsize companies and personal users; and IBM Japan Services Business Co.

On the whole, the restructuring has been well-received by Japanese users. "I'm not worried about IBM because it has various good products: mainframes, office computers, workstations and personal computers. I think IBM can change with market changes," says Hisatsune Ichimura, manager of the system planning department at Nomura Securities Co. in Tokyo.

IBM's changes have caused introspection at end-user companies as well. "The restructuring of IBM has a good effect on us. The airline business is a host-oriented industry. Eventually, though, we will be changing direction," says Eiichi Matsubara, director of planning for information management and systems at Japan Airlines (JAL) in Tokyo.

That direction for JAL includes more PCs, network servers and a shift to client/server (see story at left).

"By 1995 to 1996, large hardware vendors must shift their income structure from mainframe-oriented hardware to client/server," says Yuji Ogino, chairman of consulting firm IDC Japan and editor of the *IDC Japan Report* in Tokyo. Mitsubishi Electric Corp., for one, recently stopped development on mainframes and moved to client/server systems. "A new focus on software and service revenue will offset the loss of hardware sales," Ogino says.

Evidence of that shift is already piling up. For example, IDC Japan predicts that mainframe sales will grow a paltry 0.7% annually between 1991 and 1996. In contrast, PC/workstation sales are expected to grow 8.5%, software 22.5%, application tools 20% and services 8.3% during that same time.

—Lori Valigra

Japan tries out U.S. cost-busters

Downsizing, especially to client/server setups, isn't the only global trend making a push in Japan. Other practices that have been standard fare for U.S. IS managers are only now making headway in Japan in response to tight times:

• **Consolidating, Japanese-style.** During the next three to five years, Nomura Securities in Tokyo will reduce the number of its computers, in some cases replacing two old mainframes with one more powerful new model. "We can cut maintenance, electric power and space costs and reduce the number of operators," says Hisatsune Ichimura, manager of the system planning department at Nomura Securities. The company currently has 30 mainframes.

• **Renting excess capacity.** The recession has pinched Japanese financial companies particularly hard. These companies had ramped up computer capacity in anticipation of business demand, only to see business fall off, leaving excess capacity behind. Some companies, such as Nomura Securities, are turning ill fortune into profits, renting capacity to outsiders.

• **Paying for support and service or doing it yourself.** In the past, when a Japanese company bought a product, it could expect lots and lots of hand-holding, including free support and service. That is changing. With hardware becoming a commodity, Japanese vendors are looking to make more revenue from services and software. This goal is at odds with the thrust of users, who are trying to get good service while trimming service and maintenance costs.

Some Japanese companies are taking matters into their own hands, creating in-house support and service groups. Nomura Research Institute, for example, supplements Nomura Securities' IS department of 15 with about 300 of its own system engineers. Japan Airlines has its own software development subsidiary, Japan Creative Systems.

• **Using standard and packaged software.** Japanese companies are realizing some savings by turning to industry-standard software such as DOS V for PCs and Unix for key business areas. The trend is growing. "A lot more people are advertising for Unix vacancies now, both at end-user companies and in industry," says Phil Hordle, head of information technology at Barclays Services Japan Ltd., a Tokyo subsidiary of Barclays PLC.

• **Farming out functions.** IBM Japan, NEC and Fuji Xerox Co. have been offering systems integration services for end users with multivendor installations. The range of services and prices available in Japan will be a boon for end users. Charles F. Cronheim, director of IS at Mobil Sekiyu, says, "We'll have the opportunity over the next few years to reduce costs by negotiating better deals, talking with new market entrants and seeing new service." *— Lori Valigra*

Rising sun, falling prices

Compaq leads onslaught of PC price cuts in Japan

By Lori Valigra

Compaq Computer Corp., known for high-priced PCs until it sparked a slide in U.S. PC prices in 1992, has taken its mission to Japan. The price-cutting explosion the company set off may heat up the downsizing trend occurring in Japanese user companies, which have traditionally been big iron shops.

"The price of personal computers has been almost halved in the past 18 months in Japan," says Phil Hordle, head of information technology at Barclays Services Japan Ltd., a subsidiary of Barclays PLC. "It's a real free-for-all for users."

Last fall, Compaq challenged NEC Corp., which holds a commanding 50% share of Japan's PC market, with products priced as low as $1,032 — half NEC's price tag. From October to December 1992, Compaq sold 3,500 units in Japan, says Yuji Ogino, editor of the "IDC Japan Report" in Tokyo.

Following Compaq's moves, IBM Japan introduced a $1,597 PC. In January, Epson Corp. unveiled an NEC-compatible priced 40% below NEC's comparable machine. NEC followed with a $1,758 unit. Even Apple Japan cut prices 20%.

The real shaker came on Jan. 21, when Dell Computer Corp. launched a series of products with a low-end tag of $790. Its sales are both direct and — in a rare move in Japan — mail order, cutting out at least a half-dozen middlemen. In the middle of February, Compaq trimmed its price to $952, including software. More price cuts are rumored to be imminent.

'Scared to death'

The moves have chilled PC makers in Japan, the second-largest PC market in the world at $5.4 billion. "They are all scared to death. The computers are being sold at half the price in Japan and through direct sales, cutting out distributors," says Charles F. Cronheim, director of IS at Mobil Sekiyu K.K. in Tokyo.

During Japan's steep economic boom in the 1980s, middlemen were tolerated, even largely ignored, as part of normal business. Belt-tightening at purchasing companies has shifted focus on the layers of fat in the distribution system.

"This stampede has really awakened the Japanese," Cronheim says.

Mobil Sekiyu has a few Dell and Compaq computers now under evaluation. "Supplier loyalty is a thing of the past in PCs," Cronheim says.

Hordle explains that until a year ago it was difficult to negotiate prices, even with foreign suppliers: Because NEC's price tag was so high, off-shore firms could maintain high prices and still come in under NEC.

And because NEC had more than 5,000 software titles for its market-leading PC9800, 2,500 of which are for business applications, loyalty to NEC remained solid. By comparison, NEC's purported challenger, DOS V, a bilingual English/Japanese version of DOS for IBM PC ATs, has less than half the titles.

Still, the impact of low prices could dramatically erode NEC's big software lead during the next several years. "Much software will be converted from NEC to DOS V, and then we can use DOS V in our daily environment," says Eiichi Matsubara, director of planning for information management and systems at Japan Airlines in Tokyo.

DOS V has about a 10% market share now, including versions from IBM and Compaq, one consultant says. The product paved the way for U.S. PC makers to offer Japanese systems.

"DOS V came at a very opportune time. We had a lot of PC ATs and Japanese word processors. But with DOS V, we could bring in reasonably cheap personal computers and get a lot more out of them. We got rid of the Japanese word processors," Hordle says. Dedicated Japanese word processors are comparatively expensive.

DOS V, as well as Microsoft Japan's Japanese Excel and Japanese Word, have enabled foreign end-user companies to run DOS programs from the head office while using Japanese language processing in Japan, Hordle says.

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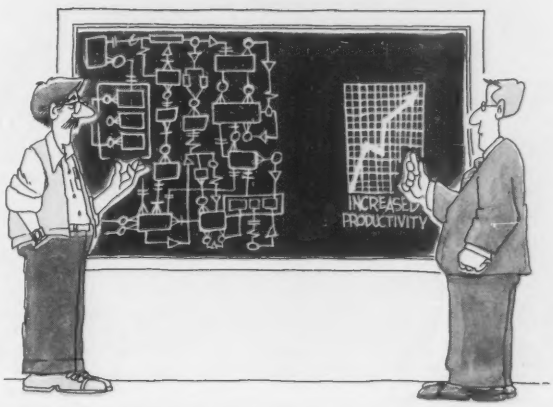

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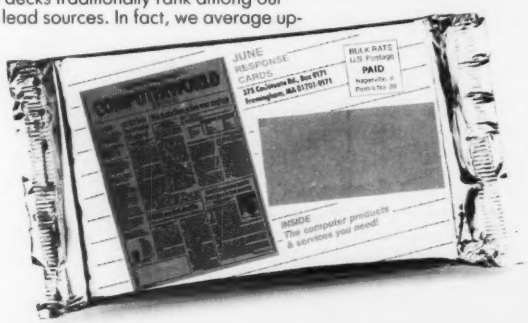

1706 inconsistent with growth plan

By Sally J. Cusack

■ In last month's State of the Union address, President Clinton emphasized change. And change in Section 1706 of the Tax Reform Act of 1986 is something independent contractors hope to see.

Clinton's speech, in which he made a push for small business and entrepreneurship, gave proponents ammunition with which to repeal the section, which makes it difficult for technical professionals to retain their independence because it exempts them from an employment tax safe-harbor provision.

"The IRS crackdown on independent contractors, particularly in the computer industry, is directly contrary to the president's emphasis on increasing the number of small businesses and encouraging high-tech industries to grow," says Harvey Shulman, a Washington, D.C., attorney who is working to modify or repeal Section 1706 on behalf of the National Association of Computer Consultant Businesses.

Shulman says the president is encouraging small business, "but if people can't start out as self-employed contractors, how does it all begin?"

Howard Stein, executive vice president at Comsys Technical Services, Inc. in Rockville, Md., says that if such a law had been in effect when Comsys got its start in 1979, "we might not be here today. It would have been a lot harder to succeed."

SECTION 1706

One of the main reasons Section 1706 has drawn so much criticism is that it singles out the self-employed in software development, programming, systems integration and technical consulting for unfavorable tax treatment.

> Section 1706 singles out self-employed computer professionals for unfair tax treatment, making it harder for them to start their own businesses.

"It's a big issue when smaller organizations try to contract directly with an employer," says Allen N. Bradley, a partner at the Atlanta law firm Venema, Towery, Thompson & Chanbliss. While there are no hard numbers available, Bradley and others contend that Section 1706 has squashed entrepreneurship by putting hundreds of smaller firms out of business and forcing thousands of independents to become full-time employees.

The biggest impact of Section 1706, Bradley says, is that it has moved larger companies to stop using independent contractors, which closes off an avenue of opportunity for the many small technical consultants who work through brokers.

Kent Faling, owner of Computer Design Professionals, a consulting and software design company in Atlanta, experienced firsthand how the law can affect the flow of the consultant/employer relationship.

"I had a job I was following up on about a month ago that said that I would have to find a broker to obtain the job. The hiring party wanted to avoid 1706 issues," Faling says.

But Nick Cvetkovic, president of NBC Associates, Inc. in Cherry Hill, N.J., says the reason Faling and others are not able to secure contracts is because the companies don't understand the law. He says most companies don't realize that Section 1706 applies only if a three-party relationship exists between a contractor, a broker and a firm.

Cvetkovic hasn't been personally affected by the law. "I've contacted 47 brokers in the last six months, and in no cases was 1706 a barrier to doing business," he says. Most of the firms he deals with are small (10 to 100 employees) consulting firms, and it is the larger firms that tend to shy away from independents.

Stein agrees that most third-party service firms prefer to avoid independent contractors since the enactment of Section 1706. Since 1987, 99% of Comsys' payroll has been W-2 employees, he says. Prior to 1986, Comsys hired almost entirely from a pool of independents.

Unfairly applied

While Section 1706 hasn't hurt Comsys, Stein says he opposes the section because it unfairly singles out technical professionals. Cvetkovic agrees, even though he hasn't found it to be a barrier. But he says the energy being expended on the repeal of Section 1706 would be better spent educating clients.

Acknowledging his own cynicism, Stein says, "If you don't have the forces in Washington behind you, you'll have a tough time."

If Cvetkovic is right, technical professionals would be well-advised to investigate Section 1706 before venturing out on their own. Section 1706 doesn't affect independents who understand the ins and outs of the law, he says.

Kelly E. Sewell, assistant editor, features, contributed to this article.

Cusack is a free-lance writer in Marstons Mills, Mass.

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Industry currents

Tables turning for textile industry

By Stefanie McCann

■ Information systems job opportunities are beginning to pop up in the textile industry, thanks to increased customer demand and the threat of competition. Some see this as a sign of greater growth to come.

Now that technology is finally taking hold in an industry traditionally far behind in this area, IS job openings are becoming available, says Deborah Poole, corporate director of information services at Guilford Mills, Inc. in Greensboro, N.C.

Some textile companies are embracing electronic data interchange (EDI) to stay in contact with customer sites and to aid in order-taking. Others have systems on the factory floor to track orders or to monitor quality. Still others are using computer-aided design/manufacturing (CAD/CAM) to design sheets and fabrics.

Speedy delivery

All of these changes boil down to one goal: Textile companies need to get their products to customers faster while still maintaining quality or they risk losing business. After they take an order, many must fill it within 24 hours. This new standard for rapid response has meant a much greater reliance on IS.

West Point-Pepperell, Inc., for example, is reducing its turnaround time on sheet designs by moving design onto CAD/CAM workstations. "What used to take weeks to design with pen and paper can now be done in a day with CAD/CAM," says Norman Williams, director of EDI services.

IS staffing at the West Point, Ga., manufacturer of domestic goods (such as sheets and towels) is expected to expand by 8% or 9% this year, according to Williams.

Additionally, West Point-Pepperell has 12 people dedicated to EDI, most of whom were programmer/analysts trained in EDI by the company. In fact, many other textile companies now use some form of EDI to communicate with their various plants, retailers and vendors.

Carolina Mills, Inc. in Maiden, N.C., is beginning to expand its use of EDI by asking more of its customers to use it. When it has all its customers up and running with EDI, the company predicts it will increase its seven-person IS staff. But Barry Perryman, operations manager, says he will do most of his hiring from within before turning to the outside.

Spartan Mills, a Spartanburg, S.C., manufacturer of yarn and finished dyed fabrics, has gradually grown from two to 24 systems analysts in the last seven years, according to John Couch, systems development manager.

Right now, Spartan Mills is most interested in acquiring IS talent who can advance its migration to client/server and have knowledge of SQL, Unix and products such as Powersoft Corp.'s PowerBuilder.

Guilford Mills is seeking expertise in small systems development and relational databases. The company is planning to move from a mainly Application System/400 environment to open systems by using a fourth-generation language to revamp its applications. Once it selects its vendors and products, it will look for IS professionals with expertise in those areas.

To attract qualified IS professionals, textile companies offer salaries that are competitive with other industries. Programmer/analysts with three to five years' experience earn from $30,000 to $40,000 a year.

Spread thin

Not all textile companies are adding staff as they increase investment in technology, however. Some are trying to stretch existing staff over a larger systems base. For example, Dixie Yarns, Inc. in Chattanooga, Tenn., is making a big push to use systems to integrate the manufacturing process, according to David Brandt, technical services manager. To do this, Dixie Yarns is writing various manufacturing applications using Microsoft Corp.'s Foxpro, a relational database language. These applications include lot tracking and inventory control.

Dixie Yarns also uses Unix-based systems to monitor the speed of spindles, while it checks for thin or thick spots in the yarn or any impurities within the yarn. These systems also give production figures, weight and a product's location on the line.

Unfortunately, IS is largely seen throughout the organization as a cost center and not a process center, Brandt said. He is being forced to look into intelligent subsystems that can be controlled remotely because he does not have a large enough staff to monitor them locally.

Nevertheless, in an industry that's been held back for so long, Dixie Yarns seems to be the exception. As textile companies continue to advance, job opportunities are sure to follow.

McCann is assistant researcher.

Textiles

Where the jobs are: Primarily in the Southeast, especially North Carolina, South Carolina and Georgia.

Salary range: $30,000 to $40,000 for programmer/analysts with up to five years' experience.

Valued skills: Cobol, EDI, computer-aided software engineering, CAD/CAM, PC knowledge.

Industry outlook: Within the next five to 10 years, late-blooming textile companies will catch up to other manufacturing industries.

Training challenge

Training is one of the bigger challenges facing IS staffs at textile companies. This is because the education levels of employees, who range from plant workers to top administrators, vary greatly.

Guilford Mills provides intensive corporate training classes for all levels of its employees.

Greenwood Mills, Inc. in Greenwood, S.C., created an easy-to-use system to meet employee needs. The IS staff realized that workers on the plant floor had limited formal education and almost no computer training. So they created a system that let workers access information with less keying, says Jack Hill, director of system services. —*Stefanie McCann*

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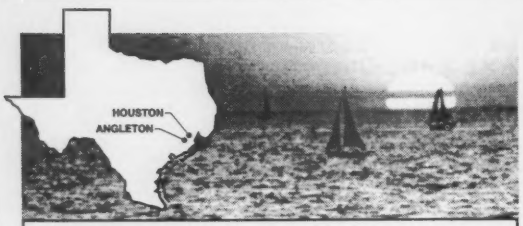

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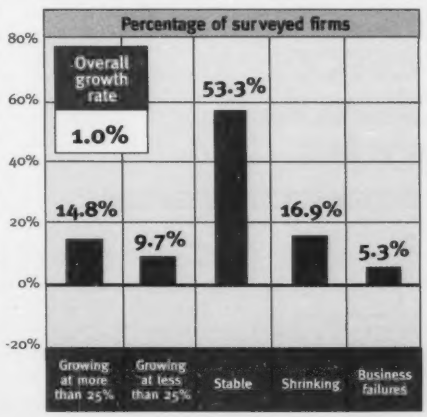

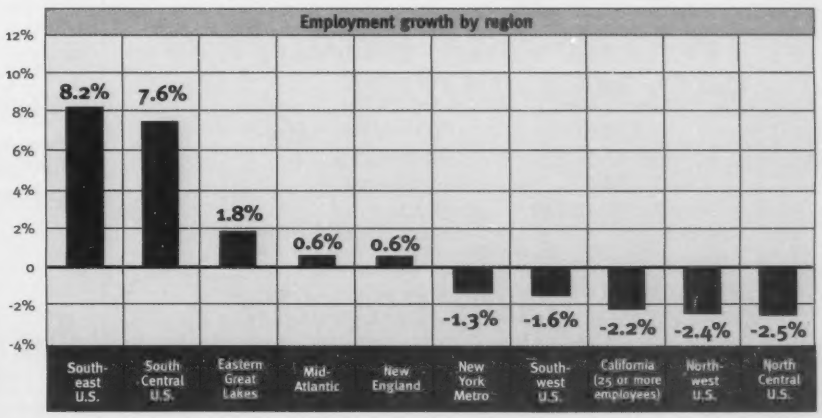

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Marketplace

BUY the RIGHT notebook

wheeling & dealing

By Mark Leaser

RAPID TECHNICAL ADvancements and sharp price drops in notebook computer technology challenge the buyer looking for a deal. Do you wait for lower prices, or do you buy now? Is it more cost-effective to get a feature-packed system all at once, or add a little at a time? Fortunately, there is a right way to buy a new notebook computer. Guidelines for a smart purchase are listed below.

Timing Timing is everything, so buy early in the life cycle — but not too early. Purchase a new notebook model two to three months after it has been released to avoid the high prices that usually accompany a newly released product. More importantly, you get it at the beginning of its useful life cycle, which in terms of features is about 18 months.

Color If you plan to resell your notebook within two years, consider color. Within a year, standard notebooks will be equipped with active-matrix color screens that produce brilliant, crisp colors, and by then, most buyers will demand it. Although this technology is expensive, active-matrix color notebook prices are falling faster than any other type of notebook.

Stay away from color screens based on passive-matrix technology. These notebooks are much less expensive, but the color quality is not as good.

Service plan Notebook computers break more often than PCs do, so consider the manufacturer's service plan carefully. Don't buy a machine from a manufacturer that requires you to bring it to a dealership for repair. The reason? Most dealers are not adequately equipped with parts to provide fast turnaround. Instead, look for vendors that offer nationwide, on-site service or allow the machine to be shipped back to them for repair or replacement.

Memory Check the maximum amount of memory that can be installed. Look for notebooks that are upgradable with special memory cards that are easily snapped in. Also, find out if you can buy memory from third-party suppliers, which often costs less than the original manufacturer's memory.

Hard disk Don't skimp on the hard disk; upgrading a disk drive after the fact is expensive. The other consideration is speed. Look for a hard drive with an average speed of 17 msec.

The battery Most users want a battery that will last all day, even though they rarely use battery power at all. If you really need battery power, buy a notebook with a nickel metal-hydride battery rather than a nickel cadmium battery. Nickel metal-hydride batteries recharge completely every time you charge them, while NiCad batteries develop a "memory" that prevents them from recharging unless they are depleted.

Brand names Always buy from one of the leading manufacturers to save money. The price differential between name brands and third-party machines is narrow. You will find a well-established market for a used system if it's a leading brand.

Ruggedness Make sure your notebook will stand up to wear and tear. Unfortunately, some companies manufacture notebooks with flimsy port covers that break during normal use such as during printer hook up. Also investigate the sturdiness of the flip-down monitor. Some monitors are easily bent by reclining airplane seats.

Modems Many manufacturers offer internal modems and fax modems, but be sure the installed manufacturer's modem will work with your software and that adequate documentation and technical support is supplied. You may even be able to save money by purchasing a modem from another company.

Docking stations Many notebook manufacturers offer docking stations that allow notebooks to be used with a full-size keyboard and monitor. They also give you direct access to your local-area network and printers.

Docking stations are very expensive, however. As an alternative, consider a device called a port extender that gives you most of the docking station capabilities. Also, before buying a docking station just to provide access to a LAN, consider a pocket-size LAN adapter that connects to a notebook's parallel port.

Leaser is president of the Executive PC Institute in San Diego, which specializes in sales force automation.

Windows checklist

Few manufacturers offer adequate machines for using Microsoft Corp.'s Windows. For the best buy, follow these guidelines:

- Look for no less than an 80M-byte hard disk; 120M bytes is more prudent with at least 4M bytes of random-access memory.
- Test screen quality. Check out active-matrix color.
- Minimum processor is a 386SX, 25-MHz system. Don't get hung up on power-saving chips; most people do not use batteries often.
- Pointing devices should be integrated within or below the keyboard. Avoid devices that hang off the side. One exception: Apple Computer, Inc.'s PowerBook integrated trackball and wrist rest.
- Stay away from notebooks that require two keystrokes for common functions such as page up and page down.

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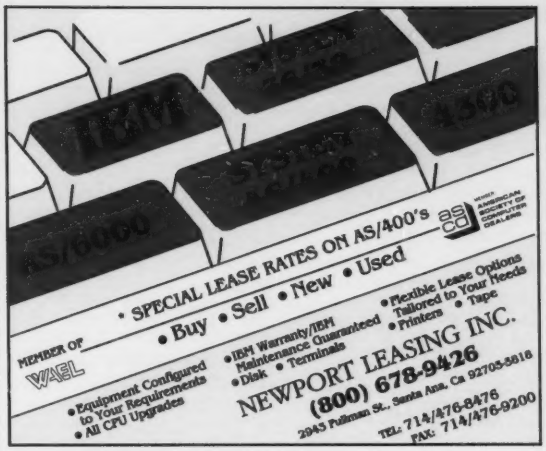

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RFP No. 2357, due Wed, 4/14/93 at 3:30 p.m. for the acquisition of consulting services in implementing a fully operational financial management system for the MS DEPARTMENT OF HUMAN SERVICES using the American Management Systems' GFS-based Statewide Automated Accounting System (SAAS) with customized enhancement to meet specific agency requirements. A mandatory bidders' conference will be held on March 10, 1993 at 9:30 a.m. local time. No Charge.

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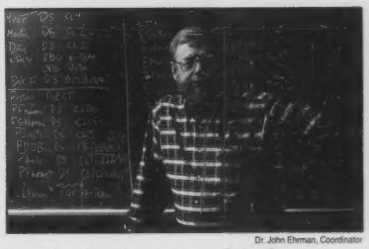

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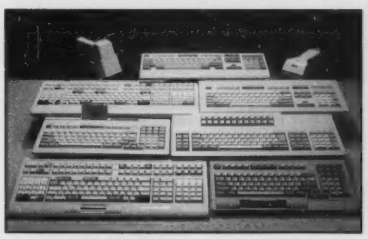

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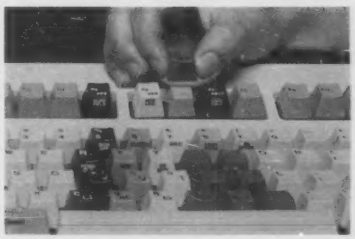

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CLSI, Inc.
Newtonville, MA ..... (617) 965-6310

MANUFACTURING

Ask Computer Systems, Inc.
Mountain View, CA ..... (415) 969-4442

Bell Atlantic Software Systems, Inc.
Sudbury, MA ..... (508) 443-7311

Data 3 Systems
Santa Rosa, CA ..... (707) 528-6560

Dlog-Remix
Anaheim Hills, CA ..... (714) 282-6422

Expandable Software, Inc.
Santa Cruz, CA ..... (408) 261-7880

GE Consulting Services, Inc.
Rockville, MD ..... (301) 340-5100

Matra Datavision, Inc.
Tewksbury, MA ..... (508) 640-0940

Micro-MRP
Foster City, CA ..... (415) 345-6000

Racal-Redac, Inc.
Westford, MA ..... (508) 692-4900

Software Horizons, Inc.
Burlington, MA ..... (617) 273-4711

SPECTRUM ASSOCIATES
Woburn, MA ..... (617) 932-0932

Symmetrix, Inc.
Lexington, MA ..... (617) 862-3200

The Peak Technologies Group, Inc.
Columbia, MD ..... (410) 992-9922

Waters
Marlboro, MA ..... (508) 624-8450

MANUFACTURING SOFTWARE

Effective Management Systems
Milwaukee, WI ..... (414) 359-9800

North Coast Automation, Inc.
Cleveland, OH ..... (216) 473-3800

NETWORKING

A-net
Eugene, OR ..... (800) 444-9796

RETAIL

Comtek Systems, Inc.
San Antonio, TX ..... (512) 340-8253

Concept Systems, Inc.
Philadelphia, PA ..... (215) 563-1425

Data Management Facility Co., Inc.
Irwindale, CA ..... (818) 813-1620

SALES FORCE AUTOMATION

Gateway Systems Corporation
East Lansing, MI ..... (800) 333-9366

SCHEDULING/PLANNING

Summit Solutions, Inc.
Chesterton, IN ..... (219) 929-4189

SECURITY

Z-Lock Mfg. Co.
Redondo Beach, CA ..... (310) 372-4842

SOFTWARE DEVELOPERS

Cadre Technologies, Inc.
Providence, RI ..... (401) 351-5950

Stepstone Corp.
Sandy Hook, CT ..... (203) 426-1875

Vanguard Software
Hudson, MA ..... (508) 562-7711

TRAINING

Carl A. Argila, Ph.D., Inc.
Los Angeles, CA ..... (800) 347-6903

TRANSPORTATION SOFTWARE

KCI/The Traffic Manager
Ft. Lauderdale, FL ..... (305) 587-2270

UTILITIES

Kaye Instruments, Inc.
Bedford, MA ..... (617) 275-0300

OASIS Technology, Inc.
Oxnard, CA ..... (805) 988-1020

WHOLESALE DISTRIBUTION

Daly & Walcott, Inc.
W Warwick, RI ..... (401) 823-8400

Arthur Ellingsen & Co.
Arlington Heights, IL ..... (708) 506-0555

National Distributor Systems, Inc.
Stratford, CT ..... (203) 378-6010

SI Handling Systems, Inc.
Easton, PA ..... (215) 252-7321

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Percent

Spinnaker Software	75.0	Cirrus Logic	-19.4
Artel Communication Corp.	35.3	Micro Focus	-18.9
Walker Interactive Systems(L)	21.7	Conner Peripherals	-18.4
System Software Assoc.	21.1	Easel Corp.	-15.8
Rasterops	18.9	McAfee Associates (L)	-14.8
Ross Systems	18.8	CE Software	-12.5
Cheyenne Software Inc.	14.2	Dell Computer Corp.	-12.2
Weitek	14.0	Standard Microsystems Corp	-11.8

Dollar

Intel Corp.	5.00	Micro Focus	-8.00
BMC Software Inc.	4.38	Cirrus Logic	-6.00
Wellfleet Communications	4.25	Dell Computer Corp.	-4.50
Cheyenne Software Inc.	3.75	Conner Peripherals	-3.75
IBM	3.75	Compaq Computer Corp.	-3.13
Powersoft	3.50	Standard Microsystems Corp	-2.38
Sybase Inc.	3.25	Apple Computer Inc.	-2.13
Chipcom Corp.	3.13	Data Race Inc.	-2.13

Tech stocks fall, bounce back

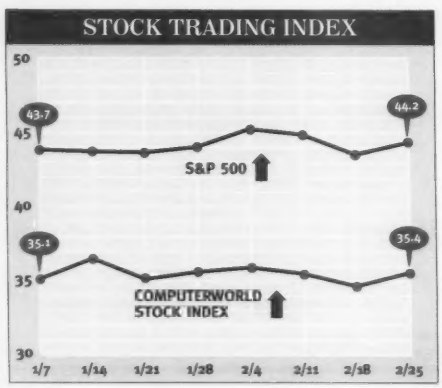
Computer industry issues experienced at least a temporary pause in their recent slide, with a number of stocks rebounding significantly in the middle of last week.

The decline in share price during the past three weeks affected stocks in growing high-tech industry sectors such as internetworking equipment and client/server software. **BMC Software, Inc.** (BMC) sank from almost 80 in early February to the high 50s last week. On Wednesday, the stock regained 3 ⅞ points and finished at 62. **Cisco Systems, Inc.** (CSCO), sailing at a 52-week high of nearly 95 in early February, fell into the low 80s before picking up 4 ⅝ points to close at 85 Wednesday. Other wilting stocks that perked up included **Microsoft Corp.** (MSFT) and **PeopleSoft** (PSFT).

Analysts attributed most of the recent declines to general market conditions rather than problems with technology vendor fundamentals. "The market has been bouncing around, and as uncertainty grows, people want to minimize their risk, which hits technology stocks hard," said James Mendelson, an analyst at Morgan Stanley & Co.

Analysts mentioned BMC Software as an example of a fundamentally strong company that has been on a share-price roller coaster. "I think their drop has been strictly due to the fallback of the NASDAQ market," said Barry King, a research director at Ladenburg, Thalmann & Co.

Mendelson said many technology stocks had been on a prolonged upward course. "The valuations were getting up there. BMC was in the 30s back in the summer, and there are a lot of others out there that have been on big runs," Mendelson said. —*Derek Slater*



Exch	52-Week Range			Feb.26 3 PM	Wk Net Change	Wk Pct Change
COMMUNICATIONS AND NETWORK SERVICES						Up 0.2%
OTC	34.63	9.63	3 COM Corp.	29.25	-0.38	-1.3
NYS	76.63	56.25	American Info Techs Corp. (H)	75.00	2.00	2.7
NYS	55.75	36.63	AT&T	55.75	2.25	4.2
OTC	3.25	0.75	Artel Communication Corp.	2.88	0.75	35.3
OTC	24.50	10.25	Banyan Systems Inc.	17.50	-1.25	-6.7
NYS	56.75	40.25	Bell Atlantic Corp. (H)	55.00	0.75	1.4
NYS	56.38	43.38	Bellsouth Corp. (H)	56.38	2.63	4.9
NYS	6.75	3.63	Bolt, Beranek & Newman	4.50	-0.13	-2.7
OTC	18.50	10.00	Brooktrout Technology	15.50	0.00	0.0
NYS	92.25	42.13	Cabletron Systems	79.00	1.25	1.6
OTC	34.50	17.75	Chipcom Corp.	31.50	3.13	11.0
OTC	94.75	33.00	Cisco Systems Inc.	87.25	2.75	3.3
OTC	27.75	5.50	Compression Labs Inc.	14.00	-0.88	-5.9
OTC	3.44	0.88	Data Switch Corp.	3.00	-0.19	-5.9
NYS	22.38	13.75	Digital Comm. Assoc.	18.13	0.13	0.7
OTC	14.75	7.25	Digital Systems Int'l Inc.(L)	7.25	-0.63	-7.9
OTC	28.50	4.00	DSC Communications	25.88	1.25	5.1
OTC	10.88	4.75	Fibronix Int'l Inc.	7.88	-0.38	-4.5
OTC	37.50	10.50	Filenet Corp.	11.25	-0.75	-6.3
OTC	4.38	1.50	Gandalf Technologies Inc.	3.38	-0.38	-10.0
OTC	1.88	0.69	Gateway Communications	1.69	0.19	12.5
NYS	10.50	2.88	General Datacomm Inds.	8.00	0.00	0.0
ASE	4.88	2.00	Go Video	2.50	-0.25	-9.1
NYS	37.75	28.88	GTE Corp. (H)	36.50	0.50	1.4
NYS	76.25	62.50	ITT Corp.	75.88	1.50	2.0
OTC	41.38	29.50	MCI Communications Corp.	40.13	1.25	3.2
OTC	13.50	2.25	Microcom Inc.	4.75	0.00	0.0
OTC	24.25	8.00	Netrix Corp. (L)	10.25	0.13	1.2
OTC	19.00	9.63	Network Computing Devices	15.00	-1.25	-7.7
NYS	16.50	8.13	Network Equipment Tech.	8.38	-0.88	-9.5
OTC	23.25	8.00	Network General	13.25	-1.63	-10.9
OTC	15.75	8.50	Network Systems Corp.	11.75	0.63	5.6
OTC	50.00	13.25	Newbridge Networks Corp.	48.50	0.13	0.3
NYS	48.13	30.50	Northern Telecom Ltd.	43.50	0.63	1.5
OTC	33.50	22.50	Novell Inc.	29.00	1.50	5.5
NYS	91.00	69.13	Nynex Corp. (H)	90.75	2.88	3.3
OTC	37.50	14.50	Octel Communications Corp.	26.00	0.75	3.0
OTC	9.00	3.38	Penril Data Comm Networks	4.63	-0.38	-7.5
OTC	48.75	10.25	Picturetel Corp.	25.00	0.38	1.5
OTC	16.75	7.00	Proteon Inc.	7.63	-0.50	-6.2
NYS	30.38	10.16	Scientific Atlanta Inc.	20.50	1.13	5.8
NYS	75.63	56.63	Southwestern Bell Corp.	74.13	1.88	2.6
NYS	28.25	20.75	Sprint Corp.	28.00	0.88	3.2
OTC	27.00	8.75	Standard Microsystems Corp	17.75	-2.38	-11.8
OTC	18.50	6.88	Stratacom Inc.	14.75	-1.50	-9.2
OTC	95.50	18.75	Synoptics Communications	80.00	2.50	3.2
OTC	7.13	4.25	Telebit Corp. (L)	5.13	-0.50	-8.9
OTC	9.38	2.13	Telematics Int'l Inc.	7.63	-0.38	-4.7
OTC	25.50	13.38	US Robotics	18.50	-1.25	-6.3
NYS	43.75	32.88	U S West Inc. (H)	43.63	1.75	4.2
OTC	46.00	12.00	Wellfleet Communications	39.25	4.25	12.1
OTC	22.00	7.00	Xircom	8.50	0.75	9.7
PC'S AND WORKSTATIONS						Off 4.2%
OTC	8.00	3.13	Advanced Logic Research	3.25	-0.38	-10.3
OTC	68.50	41.50	Apple Computer Inc.	52.88	-2.13	-3.9
OTC	24.25	11.25	AST Research Inc.	17.00	-1.25	-6.8
NYS	16.25	5.25	Commodore Int'l	5.38	-0.38	-6.5
NYS	58.50	22.25	Compaq Computer Corp.	45.50	-3.13	-6.4
OTC	49.88	15.00	Dell Computer Corp.	32.38	-4.50	-12.2
NYS	85.00	50.25	Hewlett Packard Co.	74.75	0.63	0.8
NYS	33.00	14.13	Silicon Graphics	28.38	0.00	0.0
OTC	61.00	22.50	Sun Microsystems Inc.	35.38	1.13	3.3
NYS	32.13	22.25	Tandy Corp.	23.13	-0.13	-0.5
NYS	11.13	5.00	Zenith Electronics	7.38	0.25	3.5
OTC	22.75	2.75	Zeos International Ltd.	4.75	-0.63	-11.6
LARGE SYSTEMS						Up 0.8%
ASE	20.13	6.63	Amdahl Corp.	8.00	0.25	3.2
NYS	17.63	4.75	Convex Computer	5.50	0.13	2.3
OTC	7.13	1.88	Cray Computer	3.25	-0.38	-10.3
NYS	45.00	19.00	Cray Research Inc.	26.25	1.00	4.0
NYS	13.00	7.13	Data General Corp.	12.25	-0.25	-2.0
NYS	53.13	30.38	Digital Equipment Corp.	47.75	2.88	6.4
NYS	38.63	26.63	Harris Corp.	36.50	0.75	2.1
NYS	100.38	45.88	IBM	54.00	3.75	7.5
OTC	19.50	5.50	Kendall Square Research	17.00	1.25	7.9
NYS	110.00	83.00	Matsushita Electronics	89.00	-1.25	-1.4
OTC	17.00	6.00	Pyramid Technology	14.25	0.25	1.8
OTC	24.00	11.13	Sequent Computer Sys.	19.38	-1.38	-6.6
OTC	16.38	1.38	Sequoia Systems Inc.	2.50	0.00	0.0
NYS	53.38	29.50	Stratus Computer Inc.	31.38	-1.13	-3.5
NYS	16.88	9.88	Tandem Computers Inc.	12.88	0.50	4.0
NYS	13.25	7.75	Unisys Corp.	12.38	0.63	5.3
ASE	6.88	0.06	Wang Labs Inc. (n)	0.81	-0.06	-7.1
SOFTWARE						Up 2.5%
OTC	58.75	25.25	Adobe Systems Inc.	44.63	1.63	3.8
OTC	30.00	10.25	Aldus Corp.	18.00	0.50	2.9
OTC	19.75	6.63	American Software Inc.	6.63	0.88	11.7
OTC	25.63	9.75	Ask Computer Systems	23.50	0.63	2.7
OTC	56.50	26.50	Autodesk Inc.	48.00	1.50	3.2
OTC	28.00	3.50	Bachman Info. Systems	3.75	-0.50	-11.8
OTC	43.00	34.00	BGS Systems Inc.	40.75	-0.25	-0.6
OTC	84.13	37.25	BMC Software Inc.	64.38	4.38	7.3
OTC	28.25	17.00	Boole & Babbage	25.00	-1.50	-5.7
OTC	75.00	17.50	Borland Int'l Inc.	21.00	-0.50	-2.3
OTC	9.50	3.00	CE Software	3.50	-0.50	-12.5
ASE	35.00	9.38	Cheyenne Software Inc.	30.13	3.75	14.2
OTC	19.50	8.25	ChipSoft	14.50	-1.00	-6.5
OTC	10.25	5.63	Cognos Inc.	7.00	0.13	1.8
NYS	27.38	10.88	Computer Associates	25.75	1.25	5.1
NYS	12.38	4.00	Computervision Corp.	4.63	-0.13	-2.6
OTC	18.50	6.75	Comshare Inc.	9.50	0.63	7.0
OTC	17.25	10.75	Corel Corp.	12.13	0.50	4.3
OTC	43.00	6.00	Easel Corp.	8.00	-1.50	-15.8
OTC	25.25	12.00	4th Dimension	19.00	1.00	5.6
OTC	25.50	11.75	Frame Technology	13.00	0.00	0.0
OTC	22.25	12.50	Group I Software	15.00	0.00	0.0
OTC	35.25	23.25	Gupta (L)	27.75	0.25	0.9
OTC	8.75	3.50	Hogan Systems Inc.	7.75	0.38	5.1
OTC	25.75	12.25	IMRS (L)	13.25	1.00	8.2
OTC	34.75	18.50	Information Resources	30.25	-0.88	-2.8
OTC	42.00	12.13	Informix Corp.	31.25	0.25	0.8
OTC	21.25	11.00	Intergraph Corp.	12.00	-0.50	-4.0
OTC	14.13	7.75	Interleaf Inc.	9.75	-0.50	-4.9
OTC	18.25	7.50	Intersolv Inc. (L)	8.50	-0.25	-2.9
OTC	19.50	9.50	Knowledgeware Inc.	10.75	0.25	2.4
OTC	54.75	28.75	Legent Corp.	45.75	0.25	0.5
OTC	38.75	14.75	Lotus Development	26.88	3.00	12.6
OTC	23.00	15.50	MathSoft	19.25	1.63	9.2
OTC	23.25	9.38	McAfee Associates (L)	9.38	-1.63	-14.8
OTC	8.38	1.88	Meca Software	7.00	0.63	9.8
OTC	20.25	5.25	Mentor Graphics	9.38	-0.25	-2.6
OTC	46.00	27.25	Micro Focus	34.25	-8.00	-18.9
OTC	20.50	6.50	Micrografx Inc.	7.88	-0.38	-4.5
OTC	95.00	65.50	Microsoft Corp.	83.25	3.00	3.7
OTC	36.38	12.00	Oracle Corp.	32.25	2.50	8.4
OTC	63.75	25.25	Parametric Technology	29.50	1.88	6.8
OTC	40.50	22.50	Peoplesoft	29.00	2.50	9.4
OTC	11.00	3.50	Phoenix Technologies	5.00	-0.13	-2.4
OTC	39.75	29.75	Powersoft	36.75	3.50	10.5
OTC	25.00	11.25	Platinum Technology	16.75	-0.50	-2.9
OTC	61.50	29.00	Progress Software Corp.	50.00	3.00	6.4
OTC	22.25	2.94	Quarterdeck Office Sys. (L)	3.25	0.00	0.0
OTC	29.75	11.75	Rainbow Technologies Inc.	18.13	0.63	3.6
OTC	22.75	4.00	Rasterops	7.88	1.25	18.9
OTC	17.25	3.63	Ross Systems	12.63	2.00	18.8
OTC	27.25	8.50	Sapiens USA Inc.	22.00	0.25	1.1
OTC	16.25	5.75	Software Publishing Corp.	12.13	0.25	2.1
OTC	9.13	2.00	Software Toolworks Inc. (H)	6.81	-0.81	-10.6
OTC	5.63	0.75	Spinnaker Software	2.63	1.13	75.0
OTC	16.50	3.25	State of the Art	11.25	0.00	0.0
NYS	23.63	13.75	Sterling Software Inc.	20.00	-2.00	-9.1
OTC	23.25	8.00	Struct. Dynamics Research	12.75	0.38	3.0
OTC	62.25	21.00	Sybase Inc.	56.13	3.25	6.1
OTC	48.75	5.88	Symantec Corp.	10.88	-0.88	-7.4
NYS	13.50	5.25	Systems Center Inc.	8.25	-0.13	-1.5
OTC	25.50	10.00	System Software Assoc.	13.63	2.38	21.1
OTC	10.13	2.50	Trinzic Corp.	4.00	0.00	0.0
OTC	22.75	9.13	ViewLogic Systems	17.75	-0.25	-1.4
OTC	23.75	8.13	Walker Interactive Systems(L)	10.50	1.88	21.7
OTC	4.38	1.38	Wordstar	2.38	0.06	2.7
SEMICONDUCTORS						Up 0.1%
NYS	22.50	7.38	Advanced Micro Devices (H)	21.75	-0.13	-0.6
NYS	18.75	8.63	Analog Devices Inc.	16.88	0.25	1.5
OTC	20.13	7.63	Atmel Corp.	17.38	0.75	4.5
OTC	13.38	3.25	Chips and Technologies	3.44	-0.06	-1.8
OTC	39.75	16.25	Cirrus Logic	25.00	-6.00	-19.4
NYS	16.88	7.38	Cypress Semiconductor Corp	10.25	0.00	0.0
NYS	16.13	7.00	Dallas Semiconductor	14.00	0.13	0.9
OTC	118.00	46.50	Intel Corp.	117.00	5.00	4.5
NYS	12.25	4.88	LSI Logic Corp.	11.38	0.25	2.2
NYS	25.75	12.88	Micron Technology (H)	24.50	0.13	0.5
NYS	63.00	36.44	Motorola Inc.	58.75	1.38	2.4
NYS	14.13	8.25	National Semiconductor	11.00	0.63	6.0
OTC	25.25	8.25	Sierra Semiconductor	13.38	-0.63	-4.5
OTC	38.50	22.25	SynOpsys	32.25	1.00	3.2
NYS	59.25	31.50	Texas Instruments	56.88	1.88	3.4
OTC	10.00	6.00	VLSI Technology	7.00	-0.13	-1.8
OTC	7.63	2.13	Weitek	7.13	0.88	14.0
ASE	9.63	3.50	Western Digital Corp.	8.25	-0.88	-9.6
OTC	33.25	14.50	Xilinx	30.75	1.75	6.0
OTC	27.84	12.50	Zilog Inc.	21.50	-2.13	-9.0
PERIPHERALS AND SUBSYSTEMS						Off 2.8%
OTC	28.75	10.38	American Power Conversion	24.25	0.63	2.6
OTC	30.25	20.25	Banctec Inc.	26.75	0.25	0.9
OTC	22.00	9.25	Cambex Corp.	10.50	-0.75	-6.7
ASE	18.38	6.25	Cognitronics Corp.	14.00	-0.38	-2.6
NYS	25.50	16.63	Conner Peripherals	16.63	-3.75	-18.4
OTC	38.50	10.75	Creative Technologies Inc.	31.00	2.75	9.7
OTC	30.75	14.25	Data Race Inc.	19.63	-2.13	-9.8
ASE	19.66	4.75	Dataram Corp.	9.00	1.00	12.5
NYS	28.75	7.25	EMC Corp.	23.13	-0.50	-2.1
OTC	10.50	5.38	Emulex Corp.	6.50	-0.75	-10.3
NYS	19.25	13.25	Evans & Sutherland	15.13	0.13	0.8
OTC	39.25	12.00	Exabyte	13.38	-0.25	-1.8
OTC	26.00	7.09	Intelligent Info. Systems	21.50	0.17	0.8
OTC	11.13	4.75	Iomega Corp.	4.75	-0.63	-11.6
OTC	34.75	5.75	IPL Systems Inc.	7.50	-0.50	-6.3
OTC	23.25	10.75	Komag Inc.	22.50	0.75	3.4
OTC	19.63	8.00	Maxtor Corp.	8.00	-1.00	-11.1
OTC	12.63	7.13	Micropolis Corp.	8.25	-0.88	-9.6
NYS	109.75	85.50	3M Corp	104.50	0.75	0.7
OTC	7.75	4.00	Printronix Inc.	7.00	0.25	3.7
NYS	17.13	6.88	QMS Inc.	14.38	-0.25	-1.7
OTC	17.88	12.13	Quantum Corp.	15.13	-0.75	-4.7
OTC	12.75	3.75	Radius Inc.	5.13	-0.25	-4.7
NYS	16.25	7.50	Recognition Equipment	13.00	-0.88	-6.3
OTC	13.88	6.00	Rexon Inc.	6.00	-0.50	-7.7
OTC	22.38	12.00	Seagate Technology	15.75	-2.00	-11.3
NYS	74.00	18.38	Storage Technology	20.50	0.88	4.5
NYS	25.25	16.50	Tektronix Inc.	24.75	1.00	4.2
NYS	88.88	66.75	Xerox Corp.	82.75	0.88	1.1
SERVICES						Up 1.4%
OTC	23.50	12.16	American Mgmt. Systems	19.25	0.88	4.8
NYS	5.38	3.00	Anacomp Inc.	3.25	-0.25	-7.1
OTC	35.75	16.00	Analysts Int'l	32.50	1.00	3.2
NYS	55.88	38.75	Auto Data Processing	53.88	-1.38	-2.5
NYS	17.25	8.97	Ceridian Corp.	14.88	-0.13	-0.8
NYS	18.44	12.50	Comdisco Inc.	15.75	0.63	4.1
OTC	13.00	6.75	Computer Horizons	9.75	-0.25	-2.5
NYS	80.50	57.00	Computer Sciences	74.75	0.00	0.0
NYS	10.13	7.13	Computer Task Group	7.38	-0.13	-1.7
NYS	40.50	22.00	CompuUSA Inc.	26.25	-1.75	-6.3
OTC	18.75	6.00	Corporate Software	12.00	0.50	4.3
OTC	30.75	7.75	Egghead Discount Software	8.13	-0.50	-5.8
NYS	35.88	25.25	General Motors E (EDS)	30.63	0.88	2.9
OTC	25.50	9.25	Inacom Corp.	22.50	1.75	8.4
OTC	27.00	6.25	Intelligent Electronics	14.13	0.25	1.8
OTC	14.88	6.63	Merisel	10.75	-0.25	-2.3
OTC	15.75	5.75	Microage Inc.	13.00	1.00	8.3
OTC	40.00	21.66	Paychex	37.50	1.50	4.2
NYS	83.75	59.75	Policy Management Sys.	77.75	2.50	3.3
NYS	32.75	16.81	Reynolds and Reynolds	31.25	1.75	5.9
OTC	32.00	22.00	SEI Corp.	27.75	-0.75	-2.6
OTC	24.38	16.88	Shared Medical Systems	22.75	0.00	0.0
OTC	14.38	5.75	SHL Systemhouse	8.75	0.38	4.5
OTC	29.25	18.25	Software Spectrum Inc.	25.00	1.50	6.4
OTC	32.50	20.75	Sungard Data Systems	31.75	1.63	5.4
NYS	3.50	1.13	Ultimate Corp.	1.88	0.00	0.0

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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In Brief

Andersen uptick

Citing growth in client/server computing and business process re-engineering, **Andersen Consulting** last week reported 1992 revenue of $2.7 billion, a 16% increase from the year-earlier period. More than $1 billion came from client/server consulting, up from $370 million in 1991, according to George Shaheen, managing partner. The Chicago consultancy expects its client/server business to approach $1.9 billion this year.

Zeos records Q4 loss

Zeos International Ltd. posted a fourth-quarter net loss of $7.1 million, including a $1.1 million write-off for the closure of its Occidental Systems subsidiary. The loss widened the company's 1992 deficit to $28.2 million. Sales in the fourth quarter were $46.9 million, down 47%. Overall, 1992 sales declined 10% to $206.1 million.

Intersolv in the red

A $13.2 million write-off of software development costs pushed **Intersolv, Inc.** into the red to the tune of $8.8 million in its fiscal third quarter. The Rockville, Md., application development tool maker earned $2 million in last year's third quarter. Sales in the period ended Jan. 31 fell 7%, to $20 million.

SHORT TAKES **Spinnaker Software Corp.** in Cambridge, Mass., agreed to acquire **Power Up Software Corp.**, a San Mateo, Calif., desktop publishing and personal organizer software maker.... **KnowledgeWare, Inc.** completed its acquisition of **Matesys Mathematics Systems SA**.... **Network Systems Corp.** in Minneapolis won a suit brought by the **Internal Revenue Service** over its accounting practices in the 1983-1985 period.

Clinton plan stirs optimism

Industry execs praise overall strategy but voice doubts over spending cuts

By Gary H. Anthes
and Jean S. Bozman
MOUNTAIN VIEW, CALIF.

Silicon Valley executives have the ear of President Bill Clinton — and they plan to make the most of it.

Last week, a core group of computer industry executives discussed a $17 billion technology plan with Clinton and Vice President Albert Gore at the headquarters of Silicon Graphics, Inc.

James G. Treybig: *Clinton's plan should benefit all users*

The four-year high-tech plan fleshes out many of Clinton's campaign promises about creating a new partnership between government and industry. These include tax incentives, promotion of high-performance computer hardware, software and communications technology, development of a new national high-speed data network and the use of national laboratory facilities for commercial research.

The National Bureau of Economic Research reported that a permanent increase in the R&D tax credit would boost long-term private spending on R&D by 5% to 10%. The R&D credit in the 1980s raised R&D spending by $2 billion a year while costing the U.S. Treasury $1 billion annually, the bureau said.

Partnership forged

The generally pro-business plan underscores a growing relationship between the technology-savvy Clinton administration and the computer industry, a partnership largely absent in the Reagan/Bush era. The technology program could speed the development of new technologies that would benefit users, some chief executive officers said.

James G. Treybig, president and CEO of Tandem Computers, Inc. and one of 13 CEOs in the Computer Systems Policy Project, worked through the alliance during the presidential campaign to help Clinton develop his technology policies. Clinton "has not backed off anything we agreed to," Treybig said last week. "The concepts are the same — investing in jobs, creating companies, moving the government more toward commercial technologies and encouraging the development of the data highway."

Treybig said the Clinton plan should benefit users of information technology by fostering a healthy industry, which would lead to lower prices, greater vendor stability and more innovation from stepped-up research and development.

"We can either stay on the sidelines or be a participant," said Kenneth Coleman, senior vice president at Silicon Graphics. "The new administration views technology as a natural resource to be supported, nurtured and protected, and that's different from what we're used to."

But Silicon Graphics CEO Ed McCracken warned that Clinton's combined high-tech and economic plan could run into trouble in Congress. "If he isn't able to get it through the Congress, then we've got an old tax-and-spend Democratic program," he said. "But if we can keep it clean, the administration's program is quite good."

Treybig said Tandem had analyzed Clinton's tax proposals and concluded it could live with them — with one key qualification. "We can afford more taxes, but only if he fixes the economy," he said, adding that doing so will require deeper spending cuts than the president has so far proposed.

Indeed, a number of executives voiced reservations about the spending side of the president's plan. "The spending cuts are not real and deep enough," said Mitchell E. Kertzman, chairman and CEO of Powersoft Corp. in Burlington, Mass., and a past chairman of the American Electronics Association.

However, Kertzman praised the economic plan for its likely impact on the cost of capital. "We are seeing very good proposals, both in the specifics like capital gains and tax credits, but also in the commitment to reduce the deficit, the largest single contributor to the cost of capital," he said.

Kertzman also said users — increasingly moving to distributed computing — would benefit from the technology and infrastructure likely to flow from the administration's program.

Tom Gannon, director of technology planning and development at Digital Equipment Corp., agreed, saying the president's proposed national information infrastructure would help DEC's corporate customers compete. "It will provide the ability to access all kinds of information [in order to] develop more accurate customer requirements, respond to a changing economic climate and provide a more timely interface to clients, vendors and contractors."

Michael Maibach, director of government affairs at Intel Corp., said Clinton's plan touched too lightly on regulatory reform. "We need just-in-time government, not red-tape-bureaucratic government," he said. With ever decreasing product cycle times, a delay in getting government approval to build a new semiconductor plant could be a showstopper for Intel, which is investing a whopping $1.6 billion this year on plant and equipment, he pointed out.

President Clinton's economic plan is available on IBM-compatible PC disk from the Economics and Statistics Administration, an arm of the U.S. Department of Commerce. It can be ordered by calling (800) 647-6329.

Up with technology

President Clinton's $17 billion high-tech program proposes to do the following:

- Create a national information infrastructure based on a national broadband "data highway." Accelerate development of the network, originally sponsored by Vice President Al Gore when he was a senator.
- Improve computer hardware, software and communications technology for education, training, health care and manufacturing.
- Boost federal spending on civilian R&D from 41% to 50%.
- Significantly increase funding for the government's Advanced Technology Program, which provides matching grants for industry-led R&D projects and for R&D programs at the National Science Foundation.
- Earmark 10% to 20% of the budgets of the national laboratories to partnerships with industry.
- Create a national network of manufacturing extension centers.
- Make the R&D tax credit permanent.
- Reinstate an investment tax credit permanently for small business and temporarily for large companies.
- Reduce the capital gains tax rate for long-term investors in small companies and consider other ways to reward "patient capital."
- Reform antitrust laws to permit joint production ventures.

Wysiwyg

PRESENTS

What Is Your Favorite Office Toy?

Sandra Kurtzig
Chairman
The ASK Group, Inc.

"My lawyer doll. Sometimes lawsuits come up, which I have no control over. This doll has velcro arms and legs, so I can take my frustration out on the lawyer doll by pulling its arms and legs off."

"My favorite is my water gun, which shoots invisible ink or water. I have been afraid to use the ink, though. I have used it to shoot water at people when I'm angry. I've also shot users during a meeting to cool them down."

George Brenner
VP and Director of Corporate Information Services
Universal City Studios

PHOTO: ALAN LEVENSON

PHOTO: ALAN LEVENSON

Scott McNealy
President and Chief Executive Officer
Sun Microsystems, Inc.

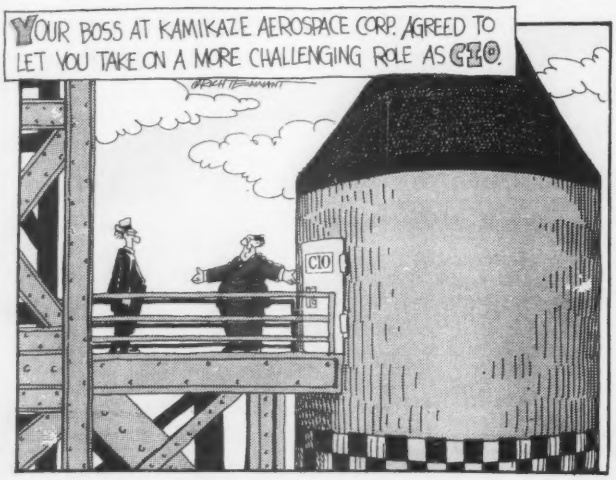
"A golf club that I swing that has IBM engraved on it. I try not to bump it too hard on the furniture."

"Whenever I'm on the phone I play with paper clips and Scotch tape. I like to bend the paper clips or roll a piece of tape into a ball, and sometimes take the paper clips and stick them together with tape."

Mary Oliveti
Manager of Information Processing
National Football League

PHOTO: ANDY FREEBERG

The Fifth Wave *by* Rich Tennant



Inside Lines

Failed memory

The IBM PC Co. has sent a letter to customers detailing memory parity problems on some of its low-end 325T ValuePoint systems. The 325T Model 6384 in specific serial number ranges can fail to produce memory parity error messages under certain conditions. Because the error occurs on DOS-only systems and IBM ships ValuePoints with Windows or OS/2 preinstalled, an IBM spokeswoman said, a customer would have to strip Windows or OS/2 from the ValuePoint to create this problem. No other ValuePoints or 386SLC-based systems have this glitch, she added. While IBM cautioned that the problem has caused no system failures, the company has created a service disk to fix it, which customers can obtain by calling (800) 845-4263.

Not so fast

Although Lotus' Improv spreadsheet is being warmly received at IS sites, one key component remains in the lab: A promised SQL interface for Improv that will allow the spreadsheet to access data stored in relational databases won't arrive until an update to Improv is delivered on April 20, said John Landry, Lotus' director of technology. The SQL interface for Improv is based on code from Pioneer Software in Raleigh, N.C.

Neighborly gesture

WordPerfect is expected to use Interop '93 Spring in Washington, D.C., next week to disclose plans to integrate its WordPerfect Office package with the Novell Message Handling System (MHS) and global directory in NetWare 4.0. The Novell pact will be a key element of WordPerfect's drive to create groupware applications using standard PC applications, relational databases and E-mail transports, said David Clare, marketing director for electronic messaging at WordPerfect. Using Version 4.0 of WordPerfect Office as a base, the company said, it plans to link its messaging system with MHS, as well as support VIM and MAPI interfaces. WordPerfect Office 4.0, which includes E-mail, personal calendaring and group scheduling software, is due this spring.

Wider NOStrils

Network General is expected at next week's Interop show to fill some gaping holes in its enterprisewide LAN analysis strategy. One big piece will be extending its expert systems support from stand-alone Sniffer to Distributed Sniffer so users will now have help analyzing LANs enterprisewide from a central location. Network General will also finally announce Sniffer support for popular SNMP-based network management platforms such as HP's OpenView, along with support of the SNMP Remote Network Monitoring standard.

Group therapy

DECUS is developing plans for restructuring the organization to meet changing market requirements that have led to a cash shortfall. A number of options are under consideration, including overhauling the entire organization and providing members with additional access to information on other vendors' products. Decisions will be made later this year and are unlikely to go into effect until well after DECUS' symposium in June.

Bill Clinton and Al Gore showed Silicon Valley folks last week that they can talk in bits and bytes as well as the locals can. During a demonstration of Silicon Graphics' visualization hardware and software, company co-founder Tom Davis showed how a picture of George Bush and Dan Quayle could be transformed into a picture of the current presidential team. "That's called morphing, right?" piped up Gore, who has specialized in technology and environmental concerns. Clinton later remarked on the value of high-speed networks, such as the Internet, in hooking workstations to remote computers. He was viewing a UCLA visualization of a section of Los Angeles that will be rebuilt after last spring's riots. Phone, fax or CompuServe News Editor Alan Alper with news tips at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively. Or try Computerworld's *24-hour voice-mail tip line at (508) 820-8555.*

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Tim Treneff, VAX Systems Manager, Kaiser Aluminum & Chemical Corporation, Rod, Bar & Wire Division.

"In our division, we've built one of the most advanced and integrated manufacturing systems I can think of. Everything runs through our databases: manufacturing, administration, and finance. Twenty-four hours a day. Seven days a week. Three separate manufacturing facilities in three different locations running as one.

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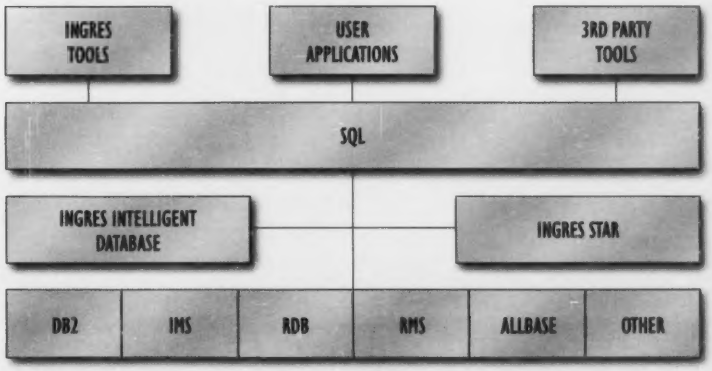

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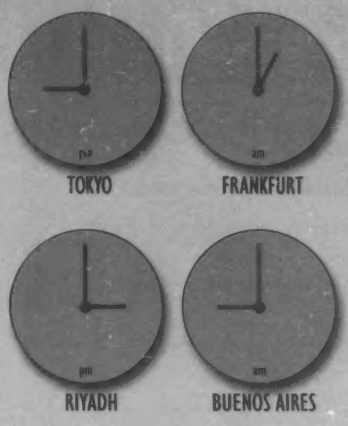

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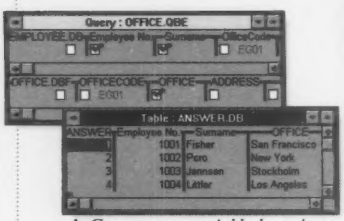

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Performance		
Insert 1,000 records*	29 sec	147 sec
Range selection: 15,000 of 130,000 records*	<1 sec	16 sec
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*All tests run on IBM® PS/2 Model 70 386/20 mhz, 4Mb RAM, Novell 3.11 NetWare, Ethernet network. Special offer good in the United States and Canada only. Prices in U.S. dollars. Dealer prices may vary. Copyright © 1993 Borland International, Inc. All rights reserved. All Borland product names are trademarks of Borland International, Inc. BI 5311